Granthana

Indian Journal of Library Studies

GRANTHANA
Indian Journal of Library Studies

Guest Editor

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Granthana: Indian Journal of Library Studies

Subscriptions

Contents

From the Editor's Desk

Granthana re-emerges from temporary hibernation as a new-look quarterly. This is the first issue of the new volume and the focus here is the public library. The public library's functions and programmes derive from the conviction that books and other printed matter as well as certain audio-visual materials are powerful, indispensable agents for bringing enlightenment, new knowledge, encouragement and inspiration to every member of the community. The diverse goals and functions of the public library are discussed in this issue in four telling articles.

Dr. H.K. Kaul's article is the key-note address delivered at the seminar on 'The Role of Public Libraries as Knowledge Centres in the Modern Society' organized by the Raja Rammohun Roy Library Foundation on the occasion of the last World Book Fair in Feb 2004. One may reasonably argue that the comprehensive sweep of the essay sets the tune for the entire present issue.

Dr. E. Rama Reddy portrays the present scenario of public libraries in India and visualizes future developments, taking Andhra Pradesh, her state, as a case-study. This was also a paper presented in the above-mentioned seminar.

V.S. Cholin and Yatrik Patel's joint-venture 'Model Strategic Plan for Public Library and Information System in India – Role of INFLIBNET' won the Second Prize in the above-mentioned competition. The article makes an attempt to highlight the important initiatives by various organizations towards networking of libraries and to suggest a suitable model for the public library system. According to the authors, the library is committed to provide and make accessible the best possible informational, educational, cultural, and recreational materials and services to the citizens of its service area. The Library's most important technology goal is to give all citizens access to information regardless of format, and regardless of where the information is stored. The secondary goal is to make that access available from anywhere in the community as far as possible.
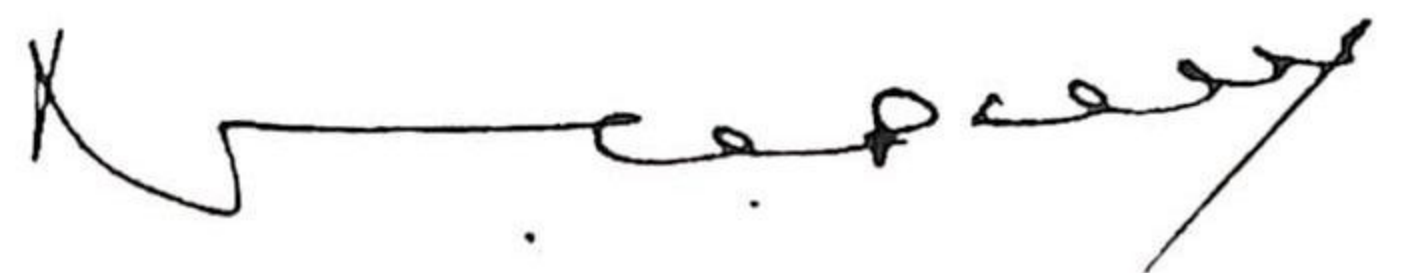
Manorama Tripathi's 'Public Libraries – A Leading Light in the Crusade

Against Illiteracy' won the First Prize in an essay contest organized by the Raja Rammohun Roy Library Foundation in 2002. The article begins by stating the obvious that India has the dubious distinction of having the largest number of illiterates in the world and that illiteracy is the root cause of under development, poverty and inequalities in the society. But then, it goes on to propose a National Programme for elimination of illiteracy through a system of public libraries spread across the country. It concludes by hinting that people with visionary thinking are required who are prepared to work hard for making public libraries pro-active in extending their services to the uplift of the society.

The other aspect that has been highlighted in this issue is the strategic repositioning of libraries in the wake of rapid strides made by Information Technology. The first of the two articles on this issue is I.C. Bandi's 'National Digital Library of India: An Overview' which is a framework for the establishment of a National Digital Library in India. It argues that National Digital Library services are based on present and future information requirements of a nation and gives overviewed structure, standards and issues of the NDL along with its software and hardware requirements.

'Applications of New Information Technology in Libraries and Information Centres' by Jagdish Arora deals with new information technologies, their applications in libraries and their products and services. As a matter of fact, the term information technology represents convergence of three strands of technologies, namely computer, microelectronics and communications. Arora argues that rapid changes in information technologies and their adoption in libraries during the past three decades have drastically changed the functions and activities of information professionals in libraries. Hence today's librarians and information professionals are required to develop skills that are needed to use and maintain IT-based services and products in their libraries.

To bring up the rear of the issue, we present to our readers annotated information on some important books published in recent months. Happy New Year and happy reading!

Nirmal Kanti Bhattacharjee

Public Libraries - A Leading Light in The Crusade Against Illiteracy

Dr. Manorama Tripathi

"Public libraries represent a massive power-house of learning. The challenge now is to mobilize these forces with a united vision".

Jonathan Douglas

The public library is a community institution where any person without regard to race, religion or economic conditions is able to obtain free access to the recorded history, learning and knowledge of mankind. It is "the people's University". It is the community's principal resource for assisting its citizens in the realization of their inalienable right to life, liberty and the pursuit of happiness.

Public libraries accompany the citizen from childhood to the grave. Public libraries can be a source of knowledge, enhancers of imagination, suppliers of diversion and pleasure. Science has greatly extended the span of human life, while our society has been encouraging or forcing individual to retire at early ages. As a result every country has an ever augmenting number of persons who have no essential occupation to fill even part of their days. Public libraries beckon such people.

Another incident from history which reflects the importance of public libraries can be stated here. When Adolf Hitler's Nazi party came to power in Germany in 1933, one of its first acts was to seize control of all public libraries. Books by Jewish authors were swiftly removed from library shelves. Non - Fascist writers were banned. On may 10th, 1933, giant Nazi bonfires consumed some twenty thousand offending books to prevent German citizens from ever reading them again. Nazi propaganda chiefs recognized the public library for what they are in any country - a key to the mind of its citizens. Control of library books meant control of the popular thoughts and ideas.

The imperative need in the country today is for a literate, informed and maturely developed citizenry. Our country has the dubious distinction of having the largest number of illiterates in the world. The direct attacks on illiteracy can take two main forms—network of public libraries conducting literacy programs (including Adult Education, Correspondence Education, Non Formal Education) and the establishment of schools with compulsory attendance for children.

Why do we need a system of public libraries?

During a visit to India in March 2000 President Clinton watched a woman enter a village health center, call up a web page on the computer and get information on how to care for her baby.[3] But this is a stray incident. The potential of information and communication technologies cannot be harnessed systematically and fully because there are millions of people in India who are incapable of writing their names even.

Our scientists and engineers have proved pioneers in the field of nuclear technology and software designing respectively while we have more than 40 crores of illiterate people. In some cities there are schools, colleges and universities which impart education using the latest modern technologies whereas villages in remote areas do not even have the benefit of primary schools and teachers.

We have great woman writers like Anita Desai, Sobha De, Arundhati Roy, Kiran Desai, Manjula Padmanabhan and other women of eminence like Sushma Swaraj, Medha Patkar who have shown their worth in different fields. At the same time there is greater number of under-privileged women who live in subjugation, unaware of their rights. We have a lot of people who are overfed, over-nourished and live extravagantly; on the other hand, there are millions who are under-nourished, starved and live in wretched conditions. Such disparities and extreme paradox co-exist in our society.

The whole world is passing through the internet revolution and India is also a part of this excitement. In the glitter, excitement and uproar of this internet revolution we bypass an important fact that only a minor part of our society is associated with it. For instance, there may be a situation in which a laborer engaged in some construction work cannot talk to his contractor over phone, reason being that he is not familiar with words and numbers. At the same time the employer of this laborer might be chatting on internet with somebody sitting miles away in New York.

There are quite a number of inequalities and huge gaps between haves and have-nots. If we go reason hunting, we will find that the root cause is high illiteracy prevalent among the masses. Though fifty years have passed since the Indian constitution adopted the universalisation of elementary education

(UEE) under the Directive Principles of State Policy, it has evaded our grasp. It is being discussed to make Elementary Education a fundamental right, the bill for which has been passed only in the Rajya Sabha. The whole world is talking about education as a human right.

In the meantime, a large number of interventions have been made in the Elementary Education sector since the National Policy on Education of 1986. Various schemes like Operation Black Board, Teacher education, Mahila Samakhya, National Programme for nutritional support for primary education and other state specific education projects have been undertaken in Bihar, Rajasthan, Uttar Pradesh and Andhra Pradesh. A large number of these interventions have also been subjected to evaluation and impact studies.[4] Inspite of all these efforts, the problem of illiteracy persists in our society.

If we want to improve, develop and emerge as a superpower, we will have to eradicate illiteracy. The system of public libraries can be used as a weapon for combating the evil of illiteracy - cause of under-development and poverty. It can identify and realize infinite possibilities for a far-reaching contribution to the complex and challenging life of this information era.

Present state of affairs

What a sad state I am in for want of libraries, of books to gather facts, noted Thomas Carlyle writing in diary while touring the English counties in 1832. 'Why isn't there a Majesty's library in every county town?' He demanded, "After all we have a Majesty's jail and gallows in every one!"

Of course we have come a long way since then. Today the very concept of the library is being re-invented giving the old store house of books and journals the power and the reach of modem media, way beyond Carlyle's Victorian imagination. But the former part of his statement is still applicable to our Indian society. There is dearth of public libraries in rural, remote areas, although we do have public libraries of prominence in metropolitan cities. There are 54,845 public libraries in India at present.

Many stalwarts like R.S. Parkhi made persistent plea in the media and on podiums that state governments in India must enact a state public library law and impose separate library tax and primary education tax to finance a network of libraries from tehsil level to the state capital. It is believed that state funded public libraries would give that much needed spur to the literacy and library movements.

At present barely 10 among India's latest tally of 28 states have a Public Library Act. In particular, in the BIMARU states already identified for their low literacy, poverty, high birth rates etc., scholars bemoan lack of public

libraries or poor condition of existing public libraries which languish without funds and staff. [5]

Advantages of a well developed system of public libraries

The public libraries can be a leading light in the crusade against illiteracy. The system of public libraries can be used as a weapon for eradicating illiteracy. Now the point arises: why do we need to eliminate illiteracy? Why do we need to have educated masses?

Illiteracy is a silent scandal. The United Nations which defines illiteracy as the inability to read and write a simple massage in any language has conducted a number of surveys on world literacy. In the first survey (1950, published in 1957) at least 44% of the world population were found to be illiterate. A 1978 study showed the rate to have dropped to 32.5%; by 1990 illiterate worldwide had dropped to about 27% and by 1998 to 16 %.

However a study by UNICEF published in 1998 predicted that the world illiteracy rate would increase in 21st century because only a quarter of world's children were in school by the end of the 20th century. The highest illiteracy rates were found in less developed nations of Africa, Asia, and lowest in Australia, Japan, North Korea, technologically advanced nations of Europe and North America.[6]

Literacy scene in India

The country has experienced an impressive rise in the rate of literacy from 52.21% in 1991 to 65.38% in 2001 (75.85% for males and 54.16% for females). This means that 3/4 of the male populations and more than ½ of the female population are literate. This still keeps India the most illiterate nation of the world – a dubious status (34.6% or 46,0 3,00,252 people are still illiterate).[7]

Education is an indispensable component of human resource development. The Kothari Commission [8] laid stress on the role of education in such words, "It is education that determines the level of prosperity, welfare and security of the people". National Policy on Education (1986) stated that education is "an investment in the present and the future". [9]

World Bank Policy Paper (1980) stated that education is responsible for:

1 Meeting basic human needs

2 Sustaining and accelerating over-all development [10]

Education can lead to the following advantages:

1) Growth in per capita income

The economic standard of a country is determined by the literacy rate of that country. The data on a few selected countries given in the following table support the above statement. [11]

Country	Percapita Income (US$)	Literacy
Nepal	1,280	27%
Bangladesh	1,530	38%
Pakistan	1860	38%
India	2230	65.38%
U.K.	22,220	100%
U.S.A.	31,910	97%

2) Productivity

Lockheed [12] found that four years of education lead to increased farmer productivity. The Farmer Functional Literacy Programme carried out in India was found to be of much help in educating farmers to utilize higher technology in farming. Educated farmers realize the necessity of soil testing etc. Education increases the level of knowledge and skills of persons engaged in production of material, food grains etc. Thus education is essential for achieving possible growth in productivity

3) Social Development

Education leads to greater awareness among people. There are many social taboos, rites and rituals that make ignorant people suffer. At times many diseases are considered as curse of supernatural forces. Without caring for any logic uneducated, ignorant people start observing various types of rituals that make their health more precarious. Education provides and facilitates freedom from such social evils. It provides protection against exploitation. For example, educated people can read various government circulars and rules and regulations concerning facilities for the poor and can take advantages of various governmental policies. They can fill up forms, read and write letters, fill up money order forms etc. without depending on touts who may exploit them. As James Madison said in 1822, "A popular government without a popular information or the means of acquiring it is but a prologue to a farce or a tragedy, or perhaps both; knowledge will forever govern ignorance and a people who mean to be their own governors must arm themselves with the power which knowledge gives."

The foundation of any democracy is informed citizen participation in the running of popular government. The public libraries can play a significant role in this connection They can dispel darkness of ignorance and enlighten the minds of the people.

4) Women Empowerment

Education is positively related to women empowerment. As per UNICEF (1997) document female literacy was lowest in Niger (7%) followed by Burkina

Faso (9%), Nepal (14%), Somalia (14%) etc.

It is observed that the women are a deprived and under-privileged lot in the countries where female literacy is low. [13]

5) Improvement in living conditions

Education develops life-long learning skills in individuals. It enables individuals to update their knowledge and skills continuously to keep themselves fit to the changing circumstances. It provides increased opportunities for employment, self-employment etc.

Lack of literacy and numeracy is one of the root causes of poverty. Part of the solution to problems in the developing countries lies in education. The people need to be fed but they also need to be able to earn their own living. The sick need a cure but they must also be taught how to avoid the unhygienic practices that make them ill. Education can bridge the gap between temporary alleviation and long time solution. [14]

Dr. A.P.J. Abdul Kalam, the present President of India, says, "I will work and sweat for a great vision, the vision of transforming India into a developed nation." [15] This 'vision' or dream can only be materalised if we have literate, well-informed people and public libraries are expected to play a significant role in this connection. In short, education is the biggest service to humanity, a society can march towards prosperity only when it has a strong foundation of education.

Literacy Programs

The public libraries should run literacy programs. Specially trained literacy tutors should be employed in public libraries in rural, remote areas. Classes should be regularly held at the library centers. Sessions should be tailored to students' (illiterate people's) needs and include how to tell time, fill out job application, read information on packages they buy, write their names etc.

The libraries should take on the responsibility of tutoring in reading and writing. They have the space and the materials; the bookish but relaxed undemanding atmosphere of the library is particularly helpful in dispelling many of the anxieties of the adult learners.

The library staff or volunteers from the society can be trained by Adult Education departments of various universities. The use of volunteers will make the literacy programs less expensive. The teaching technique of "each one teach one" can be adopted. This method was started in 1920s by a Christian missionary named Dr. Fsant Laubch during his stay among the Moro people of the Philippines. The volunteers or library staff should be trained to work with individuals whose skills are at zero literacy. The library staff should be able to identify and evaluate materials suitable and appropriate for adults who

have poor or below average reading skills.

The approach to library-based tutoring may vary from community to community. The libraries may simply coordinate and sponsor reading programs giving space, helping to secure teachers, providing publicity and promotions for the programs, supplying the needed materials for students.

The public libraries should direct effort to acquire and provide books and pamphlets specially designed to encourage the neo-literates to exercise their skills so that they do not lapse back in illiteracy.

Distance Education and Adult Education

Distance education is considered the best option to eliminate illiteracy in the country. At present there are 58 conventional universities engaged in Distance Education and 12 more are contemplating to take up similar programmes. The public libraries can play an effective role in imparting and facilitating D.E.

The horizon of Adult Education has been widely expanding in the national scenario since the last three decades. Of the various factors which have influenced its development, the launching of National Adult Education Programmes, (NAEP) in 1978 and National Literacy Mission (NLM) in 1988 have been greatly responsible for catapulting Adult Education in a natural programme of high priority. Today several types of adult education activities, Total Literacy Campaigns (TLC), Continuing Education Programmes (CEP) and experimental projects like Mahila Samakhya are being implemented in parts of India by official agencies, NGOs and educational institutions. The operationalisation of these diverse programmes has generated a variety of professional literature—literacy material, training manuals, reports, research studies. The public libraries can serve as State Resource Centers where such material can be made available. [16]

The neoliterates can be encouraged and helped by the library staff to take up Matric Examination through National Open School. The library can offer educational advisory services to the people, in addition to the assistance in self education encouraging independent study. The public libraries shall provide services to those interested in college education in another way. Information about colleges and universities including entrance requirements, tuition fees can be made available in traditional formats of catalogs, bulletins and brochures.

Thus libraries have a dramatic potential for helping the disadvantaged in our society not only to survive but also to achieve a richer, fuller life. They can introduce them to a world of information and knowledge. The difficult question is how to make library services available to people who do not have the motivation and characteristics of conventional library users, how to reach

people who, if they think about community library at all, view it as an alien and fearful word. The success of the library does not rest entirely on the quality of personnel nor on excellence of services. Further illiteracy is not greatly impacted by the simple establishment of libraries. The solution lies in educating the potential users about the importance and existence of public libraries. In this context, the publicity campaigns must be undertaken. It implies informing people of the policies, activities, resources and services of the library through the use of various media like television, radio, news papers, etc. Holding of meetings, display of posters etc. can also help.

Thus public libraries can be agencies for fundamental education. They can offer advice, recreation, guidance to children/adolescents and adults who do not come under the influence of formal education regardless of social conditions race, creed, language or profession.

Suggestions for future

I venture to suggest that a national programme for elimination of illiteracy should be chalked up. Under this programme the public libraries should aim to eradicate illiteracy in India by 2008.

- Under the first phase, public libraries should be set up in each tehsil all over the country There should be library centers in villages too. A public library can 'adopt' certain number of villages in its vicinity. After the 'adoption programme', the library centers will be required to educate the illiterate masses. The library staff will find out the exact number of illiterates in the villages—men, women, children. They will have to advocate, disseminate the importance of education among the masses.
- It will be obligatory on the part of libraries to arrange teaching sessions or camps for all the illiterates.
- The library shall obtain appropriate printed educational materials for illiterates.
- The library shall provide adequate space to accommodate the illiterates, neo-learners.
- The library shall assign staff which is knowledgeable, accessible and perceptive to meet the needs of the illiterates and neoliterates.
- In the second phase, the libraries should help the neoliterates in maintaining their reading and writing skills so that they do not lapse back into illiteracy again. The library staff can guide them to take Matric level examination through National Open School.
- The library should offer an educational and informational clearing house and referral service. The libraries shall maintain a file of

educational agencies and services they offer that may aid the neo literates. The library shall maintain personal contacts with these agencies in order to effectively guide the neo-learner. The library shall make potential neo-learner aware of educational opportunities.

- The library staff shall assist the neo-literate in decision making and educational planning. The staff can employ interview techniques to identify the needs of the neo-learners. The library staff and neo-literates should establish rapport in order to jointly evolve their learning programme. It will assist the neo-literate in the use of non-print educational materials like records, cassettes, microfilms, CD-ROMs, etc.

- In the third phase the people should be given some vocational training so that they become financially secure.

- If these steps are followed, illiteracy will definitely be obliterated from our country and all people will have joys of literacy.

- A well-developed network of public libraries, library centers should be developed from the tehsil level to the state capital. The libraries in different parts of the country can be linked with each other through telecommunication technology.

- There must be a State library Inspectorate. A central office should be established by law for the supervision of all public libraries. This office should not be a department which is a mere cog in the government machine but an autonomous administration answerable of course to the Ministry of Education. Its officers should be former librarians, professors of Library Science and such others fully conversant with all types of works relating to all types of libraries. It should not merely be a controlling body but it should also assess the grants that the state should make and finally it should give advice of all kinds.

- There should be allocation of substantial grants on yearly basis to public libraries by the state.

- Public library acts should be enacted in the states which do not have this provision.

- The public libraries should conduct literacy programs (adult education and continuing education programs) for the benefit of the people. The libraries should offer special facilities for elderly book lovers. The libraries can get popular books printed in large letters for easy reading for senior people. There should be provision for senior people to hear books on audio cassettes if reading strains their eyes [17].

- Researches have shown that crosswords, puzzles, riddles, learning a language (mental aerobics) can delay brain aging and diseases like Alzhiemer's or vascular dementia. So public libraries should provide more number of magazines, newspapers etc., for senior people.

- The library centers are expected to undertake community outreach programs. They can extend their services to those who are old, handicapped and confined to the four walls of their homes.

- The public libraries as community centers can show special care to their handicapped members. Wheel chair ramps and elevators can give them easy access to the different floors. Provisions should be there to enable the hearing impaired reach the library through TTV, a telecommunication device.

- Brallie books should be available for the visually handicapped along with the service of reading volunteers.

- For senior citizens the public libraries can arrange Book Discussion Groups. They can meet every month to discuss popular books. The choice of books can be left to the participants but the discussions can be moderated by the librarian.

- The centers can organize shows by the music maestros for the entertainment of the public.

- The public libraries should conduct talks and lectures by experts on the issues of health, hygiene, cleanliness, nutrition, deforestation, conservation of soil, environment, rain water harvesting etc. They can cultivate feeling of patriotism, compassions among the people by organizing skits and plays on such themes.

- In a nutshell the public libraries should serve to support the cultural, informational and recreational aspirations of all residents of their respective area, they must be active and not passive agents of the democratic process.

- Every public library should have a well-developed, properly organized children section. The public library makes a unique contribution by creating a desirable environment for children. It is unique because the children enter voluntarily to seek out books, records and games that amuse them, challenge them, help them understand themselves and the world of which they are a part. They are recognized here as individuals worthy of respect. No matter what their background, their progress in school, their interest or hobbies, the children preferences and desires are responded to. The library should offer an atmosphere that encour-

ages the mind to explore, to stretch out, to extend the perimeters of children capacity.

- The libraries should direct effort to encourage children to read more and more books. The libraries can organize vacation reading clubs where the children can earn a certificate or some other award for reading a certain number of books, usually 10 or more. The concept behind such programs is that the children who participate will maintain or improve their reading levels. Reading is the most important skill a child can learn not simply making out words but understanding concepts and unleashing his own imagination and ideals. Numerous studies tell us that the adults who are 'readers' are more likely to be successful than the adults who are not. Children who read for pleasure are much more likely to become readers when they grow up than those who are never introduced to books.

- In simple terms the public libraries should undertake a national reading campaign. Its aim should be to make reading not just a national priority for a short period but a priority for life for all those for whom reading is still a "closed book".

- The public libraries should aim to support and highlight innovative and effective strategies for "reader development" across the country.

- The Government of India is celebrating the year 2001-2002 as the Year of Books. The slogan for the year is "Books for all and all for Books". The public libraries should explore ways for bringing up more and more 'bibliophages' and 'bibliobibules' in the society. [17]

- The libraries should include in their collection educational toys and games like carom, chess, ludo and puzzles for children. They should encourage latent talents in these sports to blossom and flourish.

- The library centers shall conduct poetry, debate, quiz programmes for the children.

- The libraries can provide computer facilities and teach the use of computers to the children.

- Photography programmes for the children in the neighbourhood can be organized.

- 'Story hours' can be organized for small children.

- If public libraries are developed with all these provisions, then Jorge Luis Borges (author of *Seven Nights*) will be proved right as he says, "I have always imagined paradise as a kind of Library".

Conclusion

The public libraries should explore new and innovative ways to support literacy and life long learning across the community. The public libraries can serve to support the cultural, informational, recreational aspirations of all citizens of the country. A well developed, networked system of public libraries can serve as a 'window' through which the masses can see the whole world. Our job as library professionals is to ensure that the public libraries receive its fair share of attention and consideration and the proper role of public libraries at the community level is understood. Recognition should be accorded to the state and national interests which can be served by the public libraries at the community level.

So the need of the hour is to set up more number of libraries in villages, isolated and remote areas and to revamp the ones which are in dilapidated condition. What is further required is the people with visionary thinking at the forefront who are prepared to work hard to bring desirable changes.

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Model Strategic Plan for Public Library and Information System in India- Role of INFLIBNET

V S Cholin & Yatrik Patel

1.0 Introduction

The library is committed to providing and making accessible the best possible informational, educational, cultural, and recreational materials and services to the citizens of its service area. The library's most important technology goal is to give all citizens access to information regardless of format, and regardless of where the information is stored or where it is being accessed from. A network is an essential partner in this exercise because it facilitates access to vast information services. Networks have a potential to improve library services in several ways. Libraries and the Library users get benefit from accessing databases, discussion groups, full text access, document delivery through resource sharing. The continuous improvement in the networking technologies will reduce the cost of information provision, thus creating new opportunities for the library networks to play their role in information provision to the end users.

Public libraries have always supported learning. Support for learning however is not the same as making it a central feature of the service. Public libraries have a brilliant future as centres of life-long learning, offering the same sort of facilities as those suggested for universities, perhaps at a lower level. The public library would remain a source of general culture and recreation but could also act as a purveyor of information on less academic matters. The public library acts as a cultural as well as an information centre. To fulfill these roles, and to gain the necessary financial support, public libraries will need to be linked with one another and also with other types of libraries and

information sources within the country and outside. The purpose of networking of these libraries is to ensure access to all kinds of information to everyone.

Beginning has been made by the Ministry of Human Resources Development, which through University Grants Commission has established the Information & Library Network Centre to cater to the needs of academicians and research community by connecting the higher education institutions in the country at national level. The base created by INFLIBNET in terms of infrastructure at different universities and in terms awareness of the technologies available to them will play a major role in success of any further programmes in this direction. The UGC-NET being established in collaboration with ERNET-India is to set up state-of-the-art nationwide network for its universities to effect a virtual enhancement of academic infrastructure in the country. This network connects more than 170 universities in the country with proper bandwidth to access its own resources as well as resources available elsewhere. There are other library networks doing their best to provide services to the institutional libraries viz. ADINET; CALIBNET, DELNET, etc. Effort has been made in the networking of public and rural libraries in India with the first meeting held in January 2002 in the Ministry of Culture to discuss the various issues relating to providing access to rural users.

2.0 The major players who can contribute for the success of this network

With the experiences of networks like INFLIBNET at national level and its efforts to streamline the university sector, the regional and city networks likes ADINET, BONET, CALIBNET, DELNET, PUNENET, HYLIBNET, MYLINNET, MALIBNET, etc can provide adequate expertise and support for imparting training for the access to various services.

Let's discuss the activities of these centres to understand the common requirements of public and rural libraries.

2.1. INFLIBNET

Information and Library Network (INFLIBNET) is a major programme of the University Grants Commission (UGC) initiated in 1991 with its Headquarters located at Gujarat University Campus, Ahmedabad. The Programme is directed towards modernization of libraries and information centres, and establishment of a mechanism for information transfer and access, to support scholarship, learning and academic pursuits. It is also aimed at establishing a national network of libraries and information centres in universities, institutions of higher learning and R & D institutions in India. It is basically a co-operative endeavour in resource development, sharing and its utilization at national level.

Over the years, the programme has progressed steadily and since May

1996 it is an independent autonomous Inter-University Centre under UGC to co-ordinate and implement nationwide high-speed data network using state-of-the-art technologies for connecting all the university libraries in the country. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India. The Broad objectives of INFLIBNET are:

a.   To promote and establish communication facilities to improve capability in information transfer and access, that provide support to scholarship, learning, research and academic pursuit through cooperation and involvement of agencies concerned;

b.   To establish INFORMATION AND LIBRARY NETWORK "INFLIBNET" – a computer communication network for linking libraries and information centres in universities, deemed to be universities, colleges, UGC information centres, institutions of national importance and R&D institutions, etc. avoiding duplication of efforts.

Main Activities include

- Provided financial support to the tune of Rs. 6.5 lakhs each to 142 university libraries for the purpose of automation and networking.
- More than 75% libraries have become operational and started availing the recurring grant.
- Provided the core facility grant of Rs. 1 lakh each to 65 libraries to establish core facilities and get connected to network for accessing the information.
- Conducted 20 training courses to help the operational staff of these libraries to implement the IT in their libraries, and held week-long workshops for training the executives working for the libraries at INFLIBNET.
- Onsite training has been provided at more than 35 places.
- Has started providing the regional level training to help the librarians from the college libraries and provide necessary support. More than 1200 professionals have taken the benefit during the last 18 months.
- Software to run the library operation has been developed and installed at more than 90 libraries.
- Union databases development is another activity to provide access to holdings of libraries of different materials viz. serials, theses books, excerpts, projects etc and are kept online for access at http://www.inflibnet.ac.in. User-friendly search engines have been

developed to provide access to these databases.

- Implementing the MARC-21 interface to SOUL software and vice versa.
- Providing various kinds of information services such as CD-ROM based services, access to OCLC first search, contents page service, etc.
- Conducts annual convention to provide a platform for librarians and IT professionals in the form of CALIBER. Nine such programmes have been conducted successfully at different parts of the country.
- Brings out series of publications to promote the cause of INFLIBNET.
- Has initiated two major projects viz. Retrospective Conversion of Collection of Five Major Libraries and Six Document Delivery Service Centres.

More importantly INFLIBNET has been able to create an IT conscious environment in the university libraries. Librarians have now accepted the change in the libraries and eagerly working to bring these changes in their libraries.

Apart from the national Network, a few regional and city based networks have also been functional and provide services to its members. Some of them are briefly discussed here.

2.2 ADINET: Ahmedabad Library Network

ADINET is a network of libraries in and around Ahmedabad. ADINET was registered as a Society in October 1994. It is sponsored by National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Research, Government of India.

ADINET aims to bring about cooperative mode of working amongst the libraries and information centers in and around Ahmedabad. The main objective of ADINET is to promote sharing of resources and disseminate information among member libraries by networking them and creating a centralized Union Catalogue of their holdings. It plans to coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible.

Services

- On-line information - accessing the Union Catalogue.
- Inter-Library Loan
- Photocopying Services
- Current Awareness Services

- Information Service
- INTERNET Services

2.3 BONET: Bombay Library Network

- Started in 1994
- Supported by NISSAT
- Membership : 25 Libraries as members
- Facilities : large number of computers and softwares
- Services : Access to databases, email, CD-ROM etc.
- Professional Developments : Seminars, training programmes
- Located at NCST

2.4 CALIBNET: Calcutta Library Network

CALIBNET, a Government of India Project, has been launched by the National Information Systems for Science and Technology (NISSAT), Department of Scientific & Industrial Research (DSIR); and managed by the CALIBNET Society established under the West Bengal Government's Societies Registration Act, 1961. CALIBNET aims to provide the individual libraries and their reading members with cost-effective solutions to their information problems.

Services

The network is intended to provide current awareness services, SDI, union catalogue, partial databases and access to the national and international networks. Services also include:

- Access to CD-ROM databases
- LCMARC
- Biblio file
- Inside information
- Email service

2.5 DELNET: Developing Library Network

DELNET has been in operation since January 1988 and was registered as a society in 1992. It was initially sponsored by the National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Reseach, Government of India and is currently being promoted by the National Informatics Centre, Ministry of Information Technology, Government of India and India International Centre, New Delhi.

DELNET provides an array of facilities including E-mail to its two hundred forty three member-libraries including both institutional and associate

institutional members. DELNET'S relentless efforts in resource sharing have proved extremely effective.

2.6 MYLIBNET: Mysore Library Network

The National Information System for Science & Technology (NISSAT), Dept. of Scientific & Industrial Research (DSIR) took up initiatives for the design and development of library networks in India in 1985 in order to share the resources available in the libraries, located in various parts of the country. The Mysore Library Network was set up during May 1995 in the city of Mysore under the financial assistance from NISSAT. The Mysore Library Network is housed inside Central Food Technological Research Institute (CFTRI) campus.

Services

- Training for trainers in the field of Information Technology.
- Technical Assistance in the area of Library & Information Science
- Web access to union catalogue

2.7 MALIBNET: Madras Library Network

- Initiated in 1991 by INSDOC
- Feasibility study 1992
- Registered as society in 1993
- Major six objectives
- Facilities : Computers, Sybase RDBMS, UNIX
- Databases : serials, books, other INSDOC databases
- Membership : Multi-type, 15 members
- Services : email, MALIBNET card. CC. DDS, Training
- Location : INSDOC Regional Centre, Chennai

2.8 PUNENET: Pune Library Network

PUNENET is planned for implementation in four phases with the objectives of better utilization of funds through sharing of resources by creation of commonly usable databases and communication between libraries and automating the functions of the individual libraries.
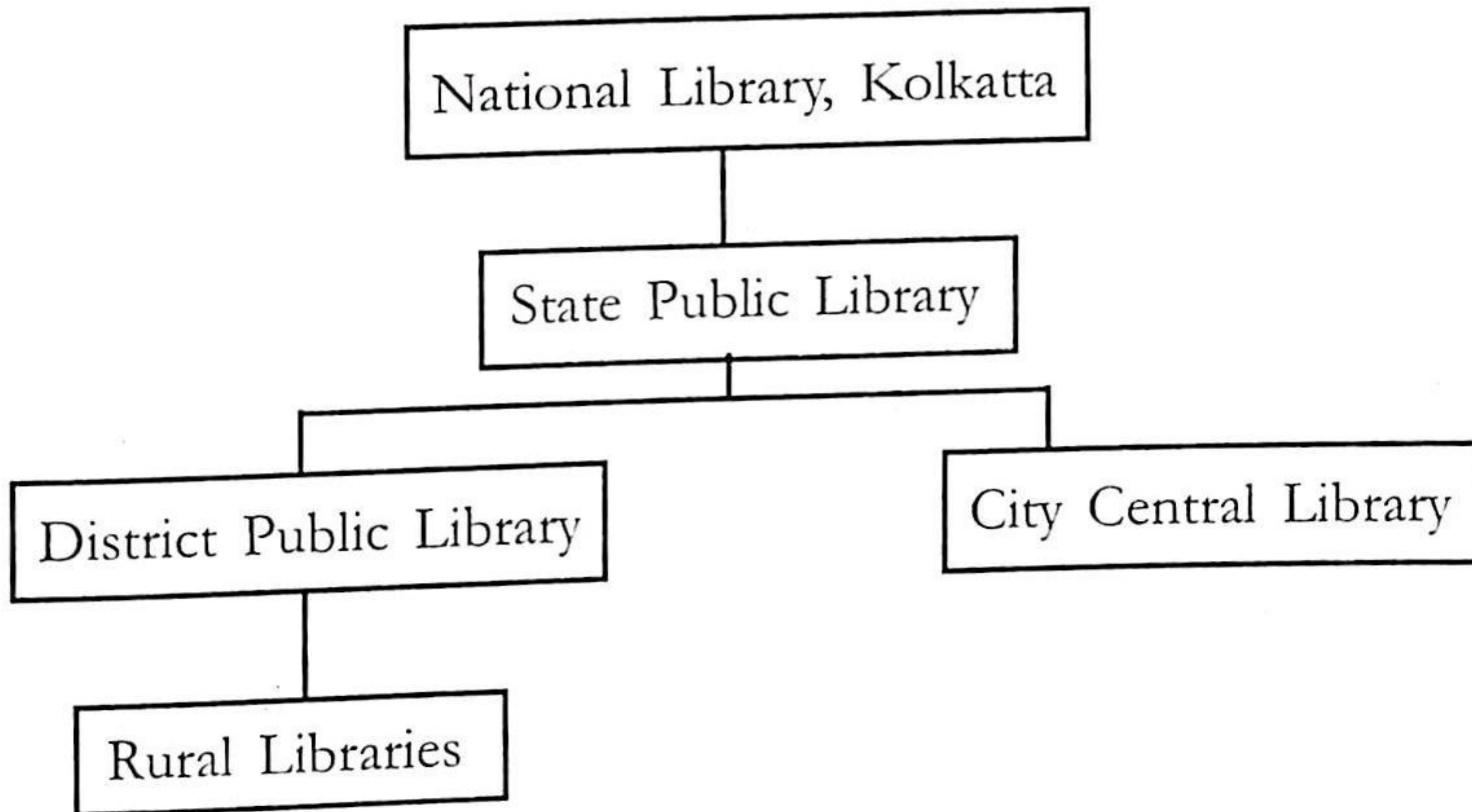
Services

The network services to be offered are union catalogue, current awareness, SDI, authority data, acquisition and fund accounting, serials control, books and journals maintenance, circulation, user services, interlibrary loan services, document transfer / copy, access to national / international databases.

There are several other city level networks, which are in their initial stage of developments.

3.0 Public Library and Information Systems in India - a Model

The umbrella of public library system in India is discussed in the following sub parameters in this paper.

```
          ┌─────────────────────────────┐
          │  National Library, Kolkatta │
          └─────────────────────────────┘
                        │
          ┌─────────────────────────────┐
          │     State Public Library    │
          └─────────────────────────────┘
                 │              │
   ┌──────────────────────┐  ┌──────────────────────┐
   │ District Public Library│ │  City Central Library │
   └──────────────────────┘  └──────────────────────┘
              │
      ┌──────────────────┐
      │  Rural Libraries │
      └──────────────────┘
```

The issues relating to each category of libraries is discussed taking into account the following factors.

* Infrastructure - computer facility with network connectivity
* Retrospective Conversion of library catalogue
* Use of software for library functions
* Human Resource Development
* Hosting the database online
* Providing seamless access to Internet and other library resources through user terminals

3.1 The National Library, Kolkata

The National Library, Kolkata was founded in 1948 with the enactment of the Imperial Library Act, 1948. It is an institution of national importance, which acts as a reference centre for research scholars. It coordinates and determines standards in the field of library services in the country.

National Library has a rich collection of resources in all disciplines in various Indian languages. The holdings contain publications in more than 60 languages. The library has huge collection of maps, manuscripts, microfishe, photographs in its collection. Access to these collections is very much important.

Identifying the requirement in terms of infrastructure for National Library is the first step. Depending on the number of terminals required in the libraries the estimation may be changed accordingly. An estimation as

well as network topology on higher side has been given at the end in the Annexure-I.

Retrospective conversion of collection in the National Library is the major requirement. In many countries the national libraries have already achieved their target of converting the collection into machine readable form and provide access. It may be noted that, considerable amount of work has been done by INFLIBNET, and other associations in this direction for academic and research library collections. UGC-NET will host a number of union databases, full text access and other services through INFLIBNET for its member libraries. The database developed for these libraries may also be hosted for further access. The combination of both these databases will not only provide access to academic databases but will also provide access to serve the interest of common public. The backbone structure of UGC-NET is given in the Annexure-II.

The National Library Kolkata has very rich collection having more than 25 lakhs, which needs to be converted into machine readable form and hosted online. Retrospective conversion has to be done using MARC-21 format, which is universally accepted. This task may be accomplished on a time-bound manner and completed in two years time. For estimation on Retrospective conversion, the unique collection of the library is considered as 15 Lakhs. The Retrospective conversion of this library will help all the state libraries, public libraries and Department of Culture libraries, etc. to get the benefit of accessing the data and copy cataloguing the common records. The cost estimation for National Library is given in the Annexure-III.

Software for automation is a pre-requisite for the networking of the libraries. The software should take care of all house keeping activities such as Acquisition, Circulation, Multilingual Cataloguing, Serials Control, Online Public Access to library catalogue. Along with these features, the software need to be compatible to records received in MARC-21 format and vice versa. There are various library softwares available in the market having advantages and disadvantages. The software developed by INFLIBNET called SOUL (Software for University Libraries) has been successfully installed at more than 90 universities and institutions and it takes care of all the requirements of a library. Though the name of the software stands for university libraries, but the software functions can suit any kind of library starting with academic library to public library. This software is developed in such a way that the future developments in the field are taken into consideration. Moreover, the team experts have spent considerable amount of time in studying the relevant softwares at national and international level. Suggestions from more than 300 librarians have also been taken and implemented. Further there is continuous development on the software to make it on par with international level softwares. The software work relating to redesigning (if required) may be done

by INFLIBNET for National Library, and the same may be purchased / negotiated to provide to other libraries.

Manpower to run these operations is very much required. Several training courses are conducted by INFLIBNET / ADINET/CALIBNET/ DELNET etc. The help may also be taken from Indian Library Association (ILA), IATLIS etc to conduct training courses at Regional Level with financial support from the Ministry. Also help may be taken from 142 universities funded under INFLIBNET Programme in conducting such programme at local level with financial assistance.

3.2 State Central Libraries

Around 25 State Central Libraries are located in state capitals or nearby. These libraries may be provided grants for establishing the infrastructure depending on the number of terminals required. These libraries may be linked through UGC Net as most of the major cities are covered under the UGC-NET.

3.3 District Central Libraries

Similarly around 550 District Central Libraries may be provided with one time grant for establishing the basic infrastructure and provide recurring grant for access to literature. These centres need to be provided with telephone and modem to access Internet. Need for establishing the LAN with 4-5 terminals at these libraries is required.

3.4 Rural libraries

The Rural Libraries need to be supported with the infrastructure of at least one computer, telephone, modem to access to general literature as well as scholarly literature. Through this approach general public can have access to not only general information but also to the scholarly academic information.

4.0 National Bibliographic Database

A National Bibliography is a complete listing of all the books and other materials published in a country. A national bibliography is generally at the apex of the bibliographical system of a country. It represents the literary and cultural activities of a country, and rather reflects its achievements thereby becoming a very significant bibliographical tool.

The compilation of a national bibliography is considered as a stupendous task, and may be for this reason that it is very difficult to find a comprehensive national bibliography with the exception of American, British and German works. This point notwithstanding, the librarians, scholars, and the governments in many countries have been taking keen interest, from time to time in compilation of their respective national bibliographies. The main objective of creating the national bibliographic database is to provide access to holdings of thousands of libraries spread across the country. Many countries

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have their resources in their national bibliographic databases viz. Australian National Bibliography at http://www.nla.gov.au/, Newzealand National Bibliographic Database at http://library.massey.ac.nz/db/nznationalbiblio graphy.htm, British National Bibliography at http://www.bl.uk/services/bibliographic/natbib.html etc. Indian National Bibliography has been conceived as an authoritative bibliographical record of current Indian publications in Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Oriya, Punjabi, Sanskrit, Tamil, Telugu, Urdu and other vernacular languages, received in the National Library, Kolkata under the Delivery of Books and Newspapers (Public Libraries) Act, 1954 (Act No. 27 of 1954 as amended by Act No. 99 of 1956). Since 1958 INB has been published regularly for the use of librarians, research scholars, publishers and those related with the book world. It not only functions as a bibliographical tool but also has become a potential source and instrument of national integration. The retrospective conversion of national library database will form a base for National Bibliographic database.

5.0 Conclusion

Since printed books will continue to be produced in large quantities, they will continue to be the core of the public library service, but they will have to be supplemented increasingly by CD-ROMs, online systems, e-books etc. Much of the use of computers by public libraries will be for exploiting the resources by enabling the users at home or elsewhere to search library catalogues, suggest items for purchase, and make reservations and renewals etc. One of the important methods of reaching the common public is to establish the information kiosks (knowledge access centers) at potential places with connectivity on demand. Another obvious role is to assist users in gaining direct access to electronic information. In the public library system, some people will enjoy searching the Internet, just as some people enjoy exploring large collection of books, and some will have time and inclination for both and others will not.

New forms of information access and storage will appear from time to time and librarians clearly have to be alert to what is happening and explore how they make use of new developments. The public libraries in India should be on the lines of public libraries in the developed countries. The public library should be utilised as a combined centre for the future provision of, and access to, printed material, audio visual and electronic media such as CD-ROMs, and access to remotely stored electronic material together with the expertise that is necessary to both organize material and access them.

Library will continue to be a dynamic provider of all types of information. The spectrum of services offered to users will enlarge with Infor-

mation Technology. With this development, library and information centres are not only able to get access to a wide variety of bibliographic information but also to multidimensional media. There will be greater use of Internet and World Wide Web knowledge repository for library operations. Full text access to scholarly literature, discussion forums on different subjects, electronic document supply, providing access to essential services by cataloguing the Internet resources to provide seamless access to end-users is essential.

It is high time for the government and other agencies to think about the public library systems and provide necessary support and guidance to bring it to the main stream of information provision. The case of public libraries is very strong and government may be persuaded to give it equal importance comparable with health and education.

Acknowledgement

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Annexure-1
Proposed Network Topology for Public Library system with cost estimation

Annexure- II
Backbone Structure of UGC Net.

Annexure- III
Provisional financial estimation for retrospective conversion

Annexure-I

Topography of Network

Gateway to other resources

National Library Kolkata and other resources

Other Resources

State Libraries with Dedicated Servers, Connectivity holding whole catalogue for the state

District/City Libraries with 5 PCs and Dedicated Permanent Connectivity

Rural Libraries with PC and Dial-up access
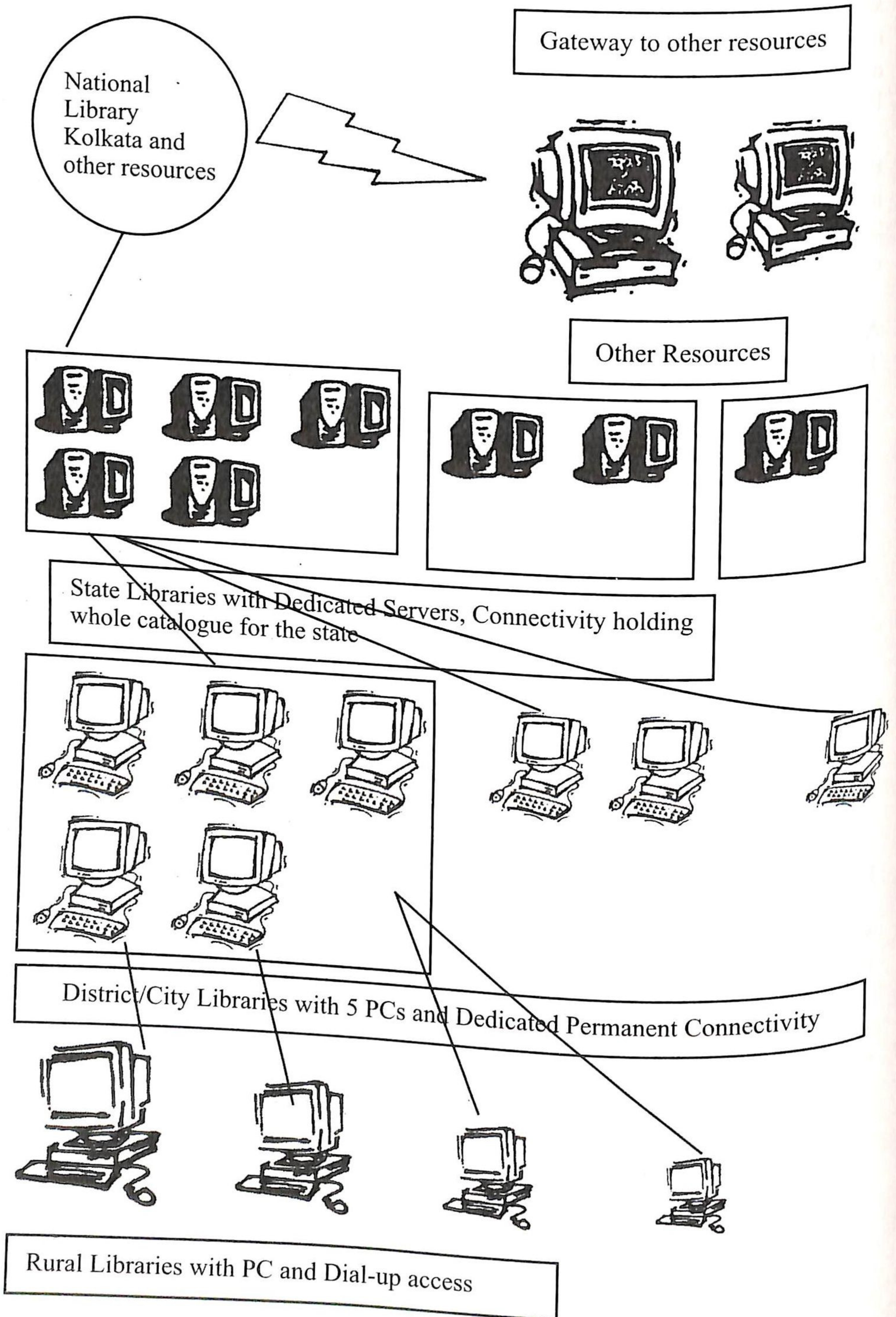
Infrastructure Requirements for Different Libraries including Hardware and Software

Items	Purpose	Numbers	Approx.Cost (Rs.)	Total (Rs.)
Rural Libraries				
Desktop Multimedia Internet ready PC Inclusive OS	Access Services as well as loacl data creation	1	50,000	
Printer and peripherals	Print services		20,000	
Dial-up Connectivity	To access District library, Internet. Other services	1	1,500	
Other Soft-ware Packages	M.S. Office, Library management, content creation	1	30,000	
Total				1,01,500
District/City Libraries				
Desktop Multimedia PC Inclusive OS	Access services as well database operation	4	2,00,000	
Low end server includ-ing server OS	To host data of rural libraries and to provide services over intranet as well as child libraries	1	1,00,000	
Dedicated 128 KBPS Connectivity	To access state libraries and provide access to rural libraries	1	2,00,000	
Software Packages	M.S.Office, Library management, content creation	Mutliple license	1,00,000	
Printer, Scanner and other peripherals	For services power supply and other requirements		50,000	
Total				6,50,000

State Libraries

Desktop Multimedia PC inclusive OS	Access Services as well as database operations	5	2,00,000	
Mid range server	One for hosting the data another to provide connectivity	2	4,00,000	
Dedicated 2MBPS connectivity	To access central library and provide access to district/city/rural libraries	1	6,00,000	
Software Packages	M.S.Office, Library management, content creation	Multiple License	1,00,000	
Other	Printer, Scanner, Multimedia devices, Audio visual devices, networking etc.		1,00,000	
Total				14,00,000

Central Library

Desktop Mutlimedia PC Inclusive OS	Access Services as well as database operations	20	10,00,000	
High end with big Storage capacity server OS	For Hosting and processing multilingual, multimedia databases	1	4,00,000	
High end sever including OS	To provide services as well as connectivity to handle multiple request	1	3,00,000	
Dedicated 2 2 MBPS Connectivity	To provide access to state/district/rural libraries	1	6,00,000	
Software Packages	Office management, Library management, content creation etc.		2,00,000	
Printer, Scanner and other peripherals	To provide services		2,00,000	
			Total	27,00,000

Annexure II

Backbone Structure of UGC Net

Backbone For UGC Net

Delhi

Guwahati

Kanpur

Kolkata

Mumbai

Bhubaneshwar

Indore

Hyderabad

Pune

Chennai

Bangalore

—— 8 MBPS Line

2 MBPS Line

1-7 Gateways

Satellite POPs
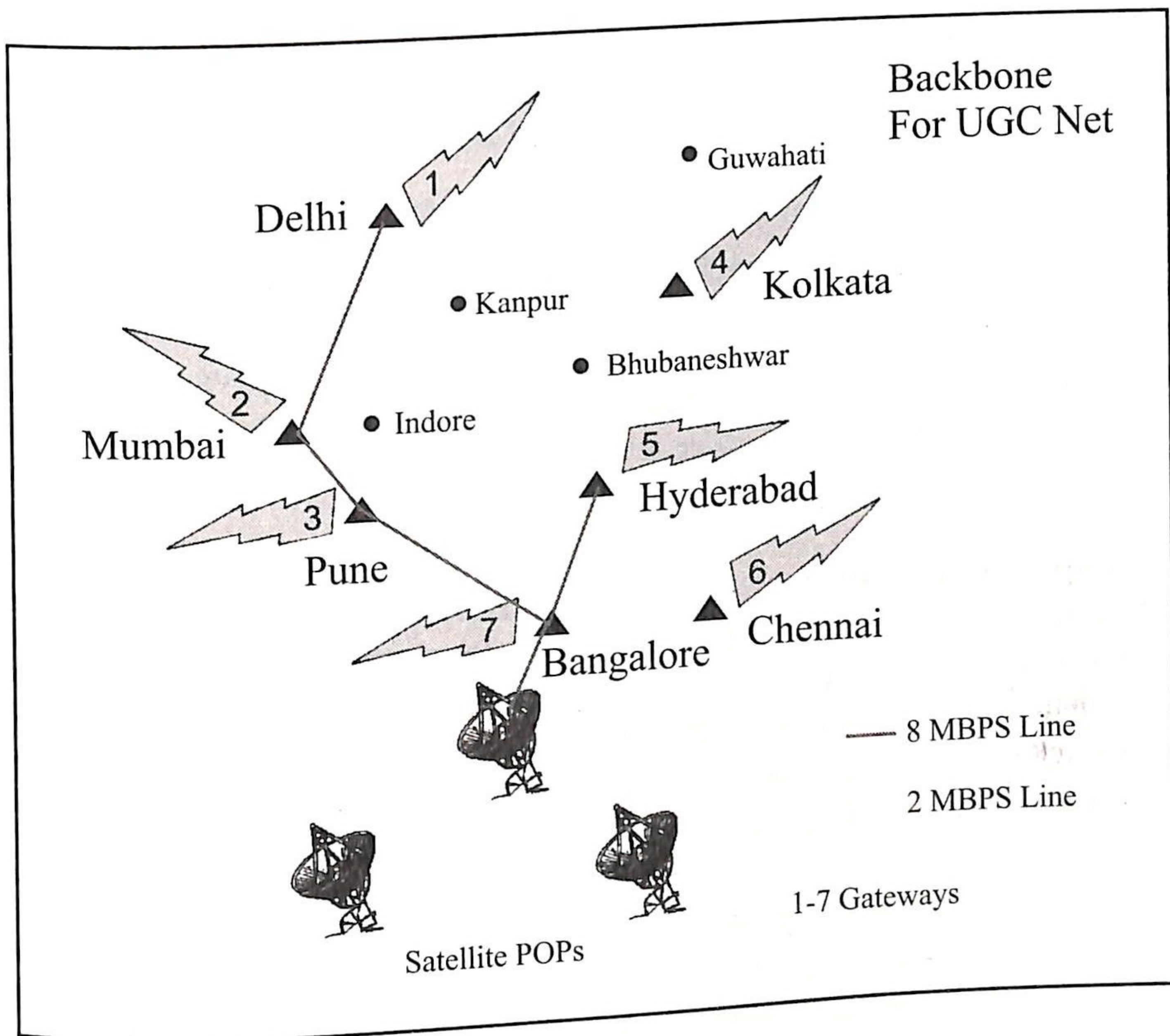
[Source : ERNET India]

Annexure III
Cost estimation for retrospective conversion of library catalogues.

Central Library	
Estimated Records	25,00,000
Estimated Unique Records	15,00,000
Standard to be used	MARC 21
Approx. Rate per Record (Rs.)	8.00
Total Cost for Data conversion	1,20,00,000

Steps for Data Conversion

1. Data input sheet preparation based on the fields according to Standards
2. Verification of input sheets, adding subject headings etc.
3. Data entry into software as per the standards
4. Crosschecking and updating of the entered data

It is expected that 70% to 80% collection of the state and district/city libraries is overlapping with the national library collection. They may download the records created by national library and avoid duplication of data conversion (Copy catalogving). Hence the data doesn't suggest any immediate requirement for retro-conversion of these libraries. However depending on the requirement these libraries may also consider retrospective conversion of their collection based on the statistics given above.

Manpower Training

Depending on the number of state, district, city as well as rural libraries, well defined training courses may be conducted for specific categories i.e. management level, operational level, user level courses. These courses may be conducted at different places across the country taking into account medium of instruction as well as cost and logistic factors.

Role of Public Libraries as Knowledge Centres in Modern Society

Dr. H. K. Kaul

1. Introduction

India has witnessed a growth in its population of illiterate people from 29.5 crores in 1951 to 35.5 crores in 2001. With the three-fold increase in its population during this period, the literacy programmes have failed to cover the whole population. Thus, the number of unemployed, both literate and illiterate, has increased and this has effected development processes in the country. If practical knowledge was imparted to people during the last fifty years, the unemployed persons could have become self-employed professionals and they could have created jobs for more people in the country. We need, therefore, to see how to make people use knowledge and be part of a flourishing Knowledge Society, that we all will have to develop.

2. The Knowledge

The universe of knowledge has not been the creation of one person or one country. It is the cumulative wealth which belongs to mankind. But this wealth is generally beyond the reach of every ordinary person anywhere in the world. In the past in India, the caste system had unfortunately associated the jobs concerning the pursuit of knowledge with a section of the society, but today with the importance of knowledge society growing fast, knowledge is now associated in principle with every human being. But all relevant knowledge is not available to everyone. It is lost somewhere or locked behind innumerable barriers. As T. S. Elliot had questioned:

> Where is the life, we have lost in living?
> Where is the wisdom, we have lost in knowledge?
> Where is the knowledge, we have lost in information?

We find now that information overload is suppressing knowledge and wisdom and either improving or disturbing the ways of our living. We therefore need to go deeper into the systems of knowledge to see how wisdom can emerge out of this new information disorder.

Knowledge is generally classified into instrumental knowledge, intellectual knowledge and spiritual knowledge. While we are somewhat familiar with the tomes on spiritual knowledge and find a large number of them on the intellectual knowledge, I am only taking recourse to instrumental knowledge, which Fritz Machlup classified into 'Professional knowledge', 'Business knowledge', 'Workman's knowledge', 'Household knowledge', and "Other practical knowledge". Cumulative knowledge present in human minds in a society determines its intellectual development. When we decide to use knowledge as a resource for meeting the basic needs of every individual, we find it is the practical knowledge that can be applied in society for better results, though moral knowledge is no less important. In the recent times we have noticed that human experience and insights, values and contextual information are applied in situations and organizations in order to derive better organizational norms and suitable results for human welfare. We therefore notice that with the changing priorities, knowledge is becoming practical in its role in life.

The recent phenomenon of globalisation and the information revolution have opened the doors of knowledge worldwide, some at a price and some without a price. However, it has become clear that through the Internet knowledge can be imparted to millions of people simultaneously. Poverty could be removed through lifelong learning and the use of knowledge skills could help.

3. Organisation of Knowledge

The methods of classifying printed documents have necessitated the Library and Information Science professionals to understand the scope of the 'Universe of Knowledge' but with the advent of the documents becoming available in digital form through the INTERNET the scope of the Universe of Knowledge has changed. With this has changed the role of the library and information science professionals. They have to be conversant with classifying digital resources and in turn every unit of knowledge. They have to evolve methods of identifying relationships between the units of knowledge and their aggregates. Consequently, the management of knowledge becomes very essential in composite circumstances wherein the application of specific knowledge for a specific user becomes necessary. Knowledge creation is a dynamic process of understanding the meaning of beliefs and their verification, as it is the application of knowledge that ultimately is important. The knowledge thus produced and distributed has economic, moral and social implications.

If we look at the moral implications first, we notice that between users and the knowledge the library and information science professionals should be working as facilitators for the propagation and distributors of knowledge. That does not happen generally at this stage.

4. The Role of Internet

We all know that the Internet has emerged as a major tool for churning information and producing new knowledge and this knowledge can be used from any Internet booth anywhere in the world. As the information overload by accessing Internet is enormous, simply accessing Internet is not going to yield good search results. While the role of experts in public libraries is essential, yet the Internet alone cannot be sufficient for accessing new knowledge. Librarians of public libraries will have to grow as specialists in each discipline and make the selection of knowledge easy and its distribution more effective.

5. What is a Knowledge Centre?

I am sure all of you know what a Knowledge Centre is. In general, a Knowledge Centre is an extended version of a public library. Here the main objective is to impart appropriate knowledge and provide useful information to the public that triggers transformation in a society. This is done by collecting, organising and disseminating both knowledge and information. A Knowledge Centre cannot undertake all these jobs on its own, but will coordinate with a variety of related institutions and experts in performing this job.

A Knowledge Centre, using computer and communication technologies and guidance of management and subject experts, collects knowledge under an interrelated system so that duplication is avoided, knowledge is pooled systematically, it is used and also forwarded to the National Knowledge Centre for wider use in various contexts. It also takes into account knowledge available locally and makes knowledge available in local languages.

The computer and communication technologies can also help in net-working knowledge and people in complex permutations and combinations provided we have the desired content and the requirements of users is available with us in machine readable form. We will also have to use the Knowledge Technology. The Knowledge Technology does not merely help in matching users' needs with knowledge resources, but also assists in taking decisions in global and futuristic perspectives.

Every day new developments take place in the knowledge sector. These have to be captured on each subject and preserved and presented in the digital form. Each Knowledge Centre will have to cull out knowledge from a variety of sources including printed sources such as newspapers, books, journals, grey literature etc., digital resources including CDs, Internet, databases, metadata etc.

and adopt research methodologies to collect information on the issues of particular interest to each Knowledge Centre. Eventually a library of topics in digital form will get developed with links and in-house resources all ready for the use of the users 24 hours throughout the year.

Each Knowledge Centre needs to have an efficient design. DELNET has its own prototype wherein specific information and knowledge needs of users including the public can have access to Health and Welfare (Primate information on health, sanitation, water, environment, etc.); Agriculture (Appropriate information on seeds, herbs, crops, seasons, etc.); Education (Language and literature, teaching aids, general science, geographic information, general history, current affairs, etc.); General Information (Information on marketing of agricultural produce, government policies within the State and in other States, transportation, employment, development programmes, finance and credit, legal, etc.); and Small-Scale Industries (Information on establishing small-scale industries and units for making every individual and family financially self- sufficient).

However, the models of the Knowledge Centres will change in application and resources from rural to the urban setting, from trading to the industrial setting, from illiterate to the literate settings among a host of settings that each social and cultural environment brings with itself.

Among the core range of services of the Knowledge Centres the integration and supply of information per topic becomes essential while considering the latest developments, comparisons, and advantages of the new technologies and the requirements of the users. Right from the basics to the benefits of knowledge concerning each topic, the Knowledge Centres will have to impart knowledge in every Indian language to the users. Users should preferably be literate to gain knowledge, but even illiterate users can use knowledge. After discovering the benefits of knowledge they can have good reason to become literate. It is the effective use of knowledge that can be used as the most potent weapon to fight against a large number of ills in the society including corruption, malnutrition, disease, unemployment, begging etc.

6. The Role of Public Libraries

The job of imparting knowledge to the people could have been done well by public libraries. That has not happened. The public library system grew only for making books and journals available to the public. In some states it worked effectively and in most of the states, ineffectively. According to the Unesco guidelines, public libraries should be strengthening reading habits, supporting self-conducted education, providing opportunities for personal creative development, stimulating the imagination and creativity of children and young people, promoting awareness of the cultural heritage, appreciation of the arts,

scientific achievements and innovations and such other activities, but this has not been happening in India. For instance in the U.S., Americans make 3.5 billion visits to school, public and college libraries each year—about three times their attendance at movie theatres. The reference librarians answer 295 million questions annually. In India the culture of seeking knowledge through additional sources except the courseware at a young age does not exist. If the state governments pump in money into public libraries for the usual library activities, it will take much time to bring in transformation in the society with the help of public libraries. In this day and age it is the practical knowledge that should become available through public libraries and that can only be done when public libraries are transformed into Knowledge Centres. This is possible at a low cost.

The public libraries can demolish the barriers between the knowledge producers and the general public, who are the consumers. For doing so they have to be creative partners for knowledge distribution and have behind them effective library professionals who can bridge the old with the new knowledge. This bridging of the old knowledge with the new will help the public in making clear and better decisions. For doing this the public libraries will have to become modernised as Knowledge Centres. We therefore need to convert about 50,000 public libraries into Knowledge Centres in a phased manner.

7. How to Convert a Public Library into a Knowledge Centre

Among several activities of public libraries, they should:

i. Bring people and experts together through various extension activities;

ii. Provide access to national and global resources through networks and the Internet;

iii. Develop knowledge repositories on existing issues of relevance to its users, including trades, avenues for higher education, interests of the unemployed, local experts/ expertise, etc.

iv. Manage content in full text form;

v. Arrange cataloguing and indexing of resources using international standards;

vi. Capture knowledge through global and national resources appropriate to its users;

vii. Give links to useful sites;

viii. Collect knowledge that removes obsolete technology being used in the locality and gives guidance for replacing it with new technology with distinct advantages;

ix. Make the Knowledge Centre as a 'One-stop Centre' for all knowledge and information requirements of its community.

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8. Knowledge Society

Nowadays, the details of a discovery can be made available to a large number of users at a very low cost and its application can result in economic development. Thus a poor economy can be transformed into a knowledge-driven economy. Small-scale individual enterprises can grow in large numbers and unemployment levels can decline drastically.

The economic implications of knowledge have given rise to the knowledge economy in a big way. Obsolescence of technology and its replacement by better technology gives rise to new products at less cost. It gives rise to competition and expansion of the market activities. Those who have access to precise knowledge create new and better products, market them well, attract finance, use raw materials effectively among other benefits they get as part of the growing knowledge economy.

Knowledge is the key to economic development of an individual or a region. While the rich are using it for wealth generation, the poor can use it for poverty alleviation using the public library services. The public libraries can provide the latest know-how about the better technologies and arrange expert advice.

A Knowledge Society can grow only if knowledge is accessible freely to people. For otherwise even the literate will become uneducated. Mark Twain says, "The man who does not read books has no advantage over the man who can not read." We have therefore to transform society into a Knowledge Society which is equitable in nature. In it every person will have to contribute at the local level in terms of experiences, initiatives or needs and this will result in local and national development with the use of practical knowledge. The need for gaining access to appropriate knowledge and the skills associated with it will grow faster. Every skilled person, creating or marketing a product will be a contributing member of the Knowledge Society. As their competencies grow, innovative changes in the products will take place and the economy will flourish. We have the examples with us of Japan, South Korea, Taiwan, Singapore, among others. However, bearing in mind the impact of global economy on a small town, city or a country, protection of local knowledge is essential until new technology is not adopted by the local population. For otherwise, there will be suffering, which will be counterproductive. The impact of globalisation or new technology should not result in the displacement but the development of the concerned people.

9. Utilisation of Knowledge

We have never quantified the users' needs nor have we ever quantified the knowledge stocks available for them in the libraries, archives and the centres of learning. We have seen nations, firms or individuals that transform practical

knowledge into commercial use gaining considerably in economic terms. We need to use tacit knowledge which is controlled by individuals, who, for fear of losing control over it, keep it out of the reach of every user. Transformation in the minds of our experts, literate or illiterate, has to take place so that this tacit knowledge is made explicit and accessible to users. The environment of sharing knowledge freely will happen when we have Knowledge Centres, like public water taps, in every colony or village, in the country. The controls will begin to vanish and every individual will try to have his share of knowledge resource available within his vicinity. The knowledge will begin to be treated as an essential commodity. It is only then when every individual will be concerned about his or her right to acquiring the desired knowledge.

10. Should Knowledge be Priced?

There is a feeling that knowledge should not be given free. At best it could be subsidised by central or state governments to the extent that it becomes affordable to the poorest person in the country. Knowledge distributed free of charge is not the knowledge that is taken seriously. Wrong knowledge reach wrong people in a totally free environment, where users will waste time and energy. It is therefore important that selection of knowledge for a user is undertaken by experts.

During the last 55 years R & D work done in scientific laboratories and institutions in India alone has not reached the public. Government on one hand supports R & D activities but on the other it lets its results be used by a few individuals or industries. Thus all R & D work does not become development-oriented. When we come down to grass-root levels, we need R & D to invent avenues for every unemployed or handicapped individual, every shopkeeper who uses old or no technology, every retired person who has the initiative, intellect and strength to contribute to the welfare of the nation and society. Therefore in the knowledge society which needs to be built, minds that produce knowledge will have to play vital roles. We need to develop an environment that promotes the use of knowledge, a system that disseminates it, and a culture that attracts every individual to use it. In our society it is only the industrial or business houses who would like to pay for knowledge. The rest are neither interested in new knowledge nor do they have a clear picture of how it would benefit them. Therefore, between the knowledge and the public, there are barriers that are hidden under the pall of darkness. We have to do away with this darkness and then remove barrier by barrier between the users and knowledge.

11. Role of DELNET

DELNET - Developing Library Network (http://delnet.nic.in) has plans to

assist the government in transforming public libraries into Knowledge Centres in some parts of India. Knowledge Centres cannot work without having access to large networked resources. DELNET provides access to about 35 lakh records of books, articles, periodicals, theses and dissertations, CD-ROMs, etc. based on the resources available with about 720 of its Member Libraries functioning in all Indian states and six countries outside India. DELNET is concerned about the exponential knowledge revolution that is evolving and is making efforts to see how it can help developing countries. In this regard the creation of appropriate content in digital form will be one of the key factors for providing service to the public, students and researchers.

We are already in touch with some State Governments and the Central Government for networking of public libraries and upgrading them into Knowledge Centres in a phased manner.

12. Concluding Remarks

The future of the country lies in accessing the right knowledge and making it available to every citizen. The priorities will have to change. Knowledge Centres will have to be opened in every mohalla and every panchayat. The Departments of Library and Information Science in the Universities will have to be converted into the Departments of Knowledge Technology. Liberal initial support needs to be given by the Centre and State Governments for converting public libraries into Knowledge Centres and for opening new Knowledge Centres. Appropriate content needs to be developed keeping in view the specific requirements of each Centre. It is hoped that in due course of time Knowledge Centres will also be opened by qualified professionals as private enterprises and can be run by them without any financial support from the government as the popularity of a Knowledge Centre will depend upon its efficiency in giving qualitative knowledge to people. The people won't mind paying the necessary fee.

Public Libraries in India: Present Scenario and Future Developments with special reference to Public Libraries in Andhra Pradesh

Dr. E. Rama Reddy

1. Introduction

A Public Library is a free public organization and a socio-economic, cultural and recreational institution without the artificial barriers such as preventing its use by the general public. It is a fact that libraries and librarians in our Country understand the emerging impact of the technological revolution but not with the same sense of urgency and intensity as those in the West

Public libraries played significant role during the India's Independence struggle. Many stalwarts encouraged the libraries and several of them identified themselves with the growth of Public Library system. Several States have enacted Public Library Acts making it obligatory for the Government to open public libraries to reach to the remotest parts of the States. Over the years Public Library activities have spread to the villages in some of the States. Since the literacy rate is not high, the demand for the library services by the users is not high, but during the recent years the role of public libraries in supporting the educational and information needs is on the increase. The students, who study and appear for examinations privately, who appear for correspondence courses, who study for competitive examinations and who are studying under the Open and Distance Education system, require support from the public libraries. Apart from the above it is necessary that the Public Libraries act as Information Resource Centers of the State, Districts and Village levels. But the public libraries have become dormant and the activities are restricted to acquisition of reading materials occasionally and not many are able to provide enough reading materials to the increasing number of users. It is also true that enough care is not taken while selecting books in the public library system.

Several public libraries predominantly are providing newspapers.

In order to serve the diverse needs of the users, the public libraries should equip themselves with the latest techniques. The libraries should know what they have in a ready to search form (machine readable form) and they should acquire the skills to find out the ways and means to seek and get the reading material from other libraries in a reasonable time, if they do not have certain materials.

2. Status of Public Libraries

Several States have adopted the Public Libraries Acts and some of the States are still to fall in line with adopting the Acts. Public libraries in India, wherever the Act is passed by the State Government, consist of the following structure:

- National Library
- State Central Libraries
- District Central Libraries
- Branch Libraries
- Village Libraries
- Mobile Libraries

Several States also have very rich collection in the form of private libraries or grant-in-aid libraries spread across the country. The rich Indian content is available in print forms in these libraries and is not available for access and use. Several libraries do not maintain these resources (rare books, manuscripts and classic collections) properly leading to disintegration of valuable traditional content. These resources need proper organization, preservation and dissemination.

3. Major Deterrents

Besides the intellectual, emotional and social factors, there are some specific deterrents to the Indian libraries for adopting computerization of library services. They are:

1. Literacy Ratio
2. Low computer literacy
3. Lack of basic Knowledge of hardware and software
4. Inadequate funds for purchase, installation and working with computers.
5. Apprehensions of manpower dislocation and unemployment.

If we wish to get a better idea of the problems related to the application of computer technology in public libraries, we should look at the literature published on this topic in the last ten years. We get a pessimistic view, which

is not very encouraging. Lack and constraints are the words most often used in these articles with no sincere efforts to plan and achieve the targets.

Nevertheless there seem to be problems connected to IT applications in public libraries, which are common to a whole range of countries. One very serious problem is the role of libraries and especially public libraries in society and lack of appreciation by national and state level decision makers. Generally, public library development is not a priority. This fact is known to all of us but in the economic situation of India this may be fatal. The idea that public libraries have something to do with information handling and access to information by means of IT is still rather unknown to decision makers. This is a fact that is often deplored by librarians.

As long as one of the most serious problems in India, i.e. the high rate of illiteracy, is not solved and as long as public libraries in the country are not prepared, Staffed and equipped to play a vital role in the struggle against illiteracy, it seems rather difficult to install equipments in places where even the basic needs in the provision of literature cannot be satisfied adequately. A large portion of this potential clientele lives in rural areas and is illiterate. Information and knowledge needs of this section of the population have been largely ignored by the prevailing book-centered philosophy of public libraries. Public libraries are becoming vulnerable and unless they can identify themselves with the new societal goals and objectives they are unlikely to be allocated a share of the national resources adequate for their needs. The result will be the continued under development of public libraries.

Libraries, especially public libraries in India, suffer from the following:

- Lack of funds
- Lack of trained manpower
- Improper physical facilities for the library
- Inadequate collection of reading materials
- Inadequate equipments
- Change of mindset of librarians and library users.

4. Modernization of Public Libraries

At present phenomenal changes arc taking place at global level in Information Technology. Presently the world is divided as Information Rich and Information Poor. Unless the Governments adopt Information Technology in public libraries, it would be highly impossible to bridge the gap between the haves and have-nots of information.

In order to serve the users efficiently, the public libraries should introduce computers into their libraries. Computers will act as efficient tools to store, organize and retrieve the materials in the libraries. They can aid the library staff to discharge their duties fast, efficient and accurate. The libraries should, as

a first step creates a database of what they have in their libraries before they could attend to the needs of the users. Several public libraries and govt-aided libraries have very rich collection. These rich collections should be available to all the people. Sharing the reading materials among the libraries is the order of the day.

4.1. Focus of Computerization

Most important aspects to be taken care of while planning library automation include:

    i.   Hardware and Software,
    ii.   Communication facilities and
    iii.   Manpower (Staff).

It is not very difficult to organize the first two but it is the third aspect most often the planners miss or take for granted. The human beings can make or mar the activities. It is here the planners have to be more careful and use tact in convincing the library professionals. We cannot do away with the existing manpower. The librarian must know and understand the tasks to be performed and the individuals involved in the work must enjoy confidence of his or her staff. The Library staff should be made part of the Automation Project. They need to know what is happening and what their roles in the changed environment are. They should be allowed to speak out their apprehensions and then efforts should be made to clear them. They should be convinced about the benefits, which the computers bring in discharging their duties efficiently. This transparency will enable them to understand before they accept the change in their day-to-day work environment. Ultimately, it is the librarian and his staff who must be committed to the Library Automation Project, otherwise, failure is the most likely outcome.

4.1.1 Hardware and Software

Hardware costs have come down drastically and libraries can decide on a better configuration keeping in view of the activities to be automated, the volume of data, number of terminals needed etc., A small committee can work on the required configuration with necessary inputs. The committee may also evaluate the available Library Application Software packages before purchasing from the market. Simultaneously, the staff training needs to be conducted in phased manner. The next step is to establish communication facilities for networking the public libraries spread across the State. It is advisable to have VSAT dish antennas at different regional centers for effective data communication as part of resource sharing among the libraries.

4.1.2. Manpower Training

Training of existing manpower needs to be considered as priority. Training sessions need to be conducted on site with hands-on-experience to the staff members in real environment. Any theoretical training sessions will not help for better and effective change over from the manual to the automated activities. Identification of staff for automation should be based on the interest and inclination of staff to learn new things and also work willingly in the new work environment.

The Vendors of the Hardware and Software normally train some staff members and these staff members in turn should train other members over a period. Any contract work given outside for creating the databases and the manpower who are not professional library staff members would lead to problems at a later date. The library staff members should take the change over as a challenge to show to others that they can learn and work in new situations.

Public libraries should focus on the following:

1. Creating databases of books and other reading materials in standard formats.
2. Sharing the existing resources over a Network
3. Creating Specialized Collection Centers, after identifying some libraries, based on the present strengths.
4. Document Imaging, Storing and Retrieval of old classics, manuscripts and rare books before they become un-usable.
5. Creating the Home pages / Web pages
6. Creating Digital resources
7. Libraries to be developed as Information Resource Centers with local content.

Step 1

*   A purchase committee to be constituted to work out an effective and efficient hardware configuration and appropriate Library Application Software package.
*   Purchase procedure to be worked out and purchase orders to be placed with vendors.
*   Site preparation, Electrical and data cabling to be taken up. Simultaneously, necessary staff need to be identified to undergo hands-on-training in Library Automation by the time the hardware is installed.
*   Cut off date to be fixed for starting the database creation and bar-coding of books

Step II

- Necessary manpower need to be identified for retrospective conversion of old records.
- Database to be made available to the users through Online Public Access Catalogue (OPAC)
- Issuing the Bar-coded Identification Cards to the users for borrowing books at the Circulation Desk.
- Network arrangements to be taken up with other libraries for sharing the available resources in the database.
- Establishing the photocopying, e-mail arid fax facilities.
- Creating an efficient Document Delivery Service among the libraries.

5. Digitization in Public Libraries

Computerization of public libraries is the first step to achieve before the libraries think of becoming digital libraries. To day we are living in exciting times, the digital libraries is the most important development in the 21st century. The information revolution not only supplies the appropriate technology for creating digital libraries but also provides the unprecedented demand for storing, organizing and accessing information. Digital libraries have the potential to be far more flexible than conventional ones. They are portable: they will be with you whenever you want them to be: in home, in the work place, in the villages. They will ultimately be seamlessly integrated with national and international sources of information for access.

Rural India is the heart of India and there are several issues that face the rural India of which the illiteracy is the biggest issue. Over 60% of Indians in rural areas are illiterates and this is the roadblock for the development and Information Technology revolution is further widening the Digital Divide. The solution to this divide is in the form of digital libraries, which can help the National Literacy Mission to achieve the literacy. The digital libraries with multimedia content can be made available over the Internet to the villages and can also make interactive learning a real solution. Facilities like the Natural Language Processing, Touch Screens, Voice Interfacing etc., can help the illiterates to use the technology efficiently.

This requires high bandwidth for multimedia-based applications to reach the villages. Entire Country need to be wired with fibreoptic cables for high speed data transmission. The village libraries, branch libraries are the best-suited places to have these facilities established for the benefit of literate and illiterate uses. These libraries should work as active information resource centers and focal points.

5.1. Action Plan

Computerization and digitization in public libraries should be taken up in phases:

Phase I

National Library, Calcutta
State Central Libraries in all the States and Union Territories
District Central Libraries covering all the districts in the country

Phase II

Branch Libraries
Private Libraries
Village Libraries

5.2. Infrastructure Requirements

- Hardware and Software including application software
- Database creation in standard formats
- Manpower training
- User training
- E-mail and Internet facilities
- Network connectivity (LAN)
- Fibre-optic and Radio Link for remote connectivity
- Book Scanners for digitization
- Storage Area Network facilities
- Digital Archival facilities

6. Public Libraries in Andhra Pradesh: Status and Action Plan

The vision 2020 proposed to establish Swarnadhra Pradesh banishing poverty and illiteracy. It also has to create a knowledge Society. Globally it is recognized that information is power. The recognized channels for the flow of information in society are Education, Libraries and Mass media. Education and Mass Media have progressed under the Plans of the Central and State Governments but the Libraries are left out. Libraries support education by disseminating structured information whereas information disseminated by the Mass media - newspapers, cinema, radio and television—is not structured which can be heard, seen and sometimes forgotten. The structured information available through libraries should be made available to all the people all the time and at all the places to create information society for over all development.

Andhra Pradesh has a glorious past of Library Movement since 1914 and it has enacted an Integrated Public Libraries Act. The Act was amended from time to time and a Grandhalaya Parishad was established with a Chairman. Andhra Pradesh Public Library System consists of the following:

1.	State Central Library	1
2.	Regional Libraries	7
3.	District Central Libraries	23
4.	Branch Libraries	1438
5.	Village Libraries	337
6.	Book Deposit Centers	413
7.	Mobile Libraries	42

6.1. Action Plan for Computerization

Computerization of Public Libraries should be considered in phased manner. In the FIRST PHASE the following Libraries to be taken up within a time frame:

1.	State Central Library	1
2.	State Regional Libraries	7
3.	District Central Libraries	23

These libraries have very rich collection and presently they are catering to large number of users. The details are mentioned below:

1.	Collection	over 18.27 lakhs
2.	Readers	over 41 lakhs
3.	Borrowers	over 2.37 lakhs
4.	Borrowed	around 12.50 lakh books
5.	Consulted	over 14.00 lakh books

The above libraries can be grouped as detailed below based, on their book collection:

Group I. **State Central Library, Hyderabad:** This is an apex library in the state and this need to be converted as Reference Library because of its rich and rare collection. Some documents need to' be digitized for Network access over the state.

Group II **City Central Library, Ashok Nagar, Hyderabad:** This is the largest District Central Library covering twin cities of Hyderabad and Secunderabad attracting large number of users. This library is fully computerized, is operational and was open for public by the Chief Minister of Andhra Pradesh on November 14, 2001. This is a model for other public libraries in the state. It has the distinction of being the first public library in the country to have all operations computer-

ized, all books Bar coded, all members are issued with Bar-coded ID cards, library card catalogue is replaced with computer catalogue (Online Public Access Catalogue) for users. All the professional staff and large number of users were trained in using the computerized catalogue. It has the Internet and e-mail facilities in the library for users.

Group III   All libraries, where the present book collection is over 50,000 volumes fall under this group. There are 11 libraries and require Rs. 1.24 crores.

Group IV   All Libraries, where the present book collection is less than 50,000 volumes fall under this group. There are 18 libraries and require Rs. 1.19 crores.

6.2. Basic Requirements for Computerization

Basic requirements include Hardware, CD-Net Server, Nodes, Peripherals, Operating system, Application Software, Site Preparation. Networking, Internet connection and staff training

- Library under Group 1 (State Central Library) requires an amount of Rs.70 lakhs approximately. Detailed configuration of Server, CD Server, Nodes. Number of peripherals, networking components, UPS requirements etc., need to be worked out based on the approval of the work.
- Library under Group II (City Central Library) requirements were worked out and computerization work was completed in the year 2001.
- Libraries under Group III, where the present library collection is more than 50,000 need an allocation of Rs. 10-15 lakhs each, based on the building, number of users, transactions and other parameters.
- Libraries under Group IV, where the present collection is less than 50,000 need an allocation of Rs. 5-10 lakhs each, based on several parameters.

6.3. Minimum requirements

Each of the above libraries under Group IV need a high-end Pentium IV, 2.5 Ghz Database Server, 5-10 clients, 5 K.VA UPS, Windows-NTVLINUX OS, licensed Library Application Software, 2 Printers, 2 Bar code scanners and a Flatbed scanner with software and also Windows 2000 with media, license and manuals.

Each of the above libraries under Group III need a high-end Pentium IV, 2.5 Ghz Database server, a CD Server, 10-15 clients, 5 KVA UPS, Servo-stabilizers, Windows NT/LINUX OS, licensed Library Application Software,

1 Laser and 2 other printers, 2 Bar code scanners, Flatbed scanner with software and also windows 2000 with media, license and manuals.

6.4. Financial Allocation

It is estimated, based on several parameters, that approximately an amount of Rs.315 lakhs is required to computerize all the major libraries mentioned above with LAN facility within the library and connecting the database server over the APSWAN for accessing the data all over the state. The estimate is for minimum computing facilities to start with and over a period of time as and when additional funds are available facilities can be upgraded by the individual libraries.

6.5. Time Frame for implementation

As we all agree, there should be a time frame for execution of the work especially in computerization of activities. Taking all things into consideration the computerization of all the above libraries should be in place within 6-8 months from the date of approval of the proposal by the Government.

6.6. Staff training

In order to implement computerization successfully in the library, the crucial component which needs attention is the human resource apart from Hardware and Software. The existing staff in the public libraries should be encouraged to undergo training in the library environment. General computer training courses will not help them except that they will be exposed to the computers. The professional library staff should work with the systems in all the modules of the library operations. Training capsules should be developed based on the existing skills of the staff in the Library. To start with 2-3 professional staff members should be chosen from each of the above 30 libraries and they should be trained with hands-on experience in an already computerized library environment. The duration of the training can be of 10-15 days in two spells. This trained manpower can train the other staff members in the library and also users in using the Online Public Access Catalogue.

7. Features of post computerization

- The Kindergarten/Children Section with multimedia facilities will attract more number of children to the library. This will also create library awareness at the young age. At present computer based children literature, which will create interest among the children, are affordable to acquire.
- The present children section collection can be strengthened with CD-ROM and multimedia-based general education, computer games, and quiz to test the numerical abilities, which creates inquisitiveness in the children.

- Since the children possess quick learning quality, they should be encouraged to use the information technology tools to support their learning in the classroom. Children section can be a laboratory for them to sharpen their abilities.

- The periodical section needs to have more than general magazines of leisure reading. Several newspapers, magazines with current information to support the information needs of general public are available in machine-readable formats, which can be made available in this section to strengthen the present setup. Public access computers to quickly access the information resources should be available here.

- The staff working in the Periodical section using computers can provide much better services with efficiency. They will have the advantage of organizing the section much better way.

- Old and valuable information available in the manuscripts and old newspapers etc., need to be stored using optical storage technology. This section needs to be strengthened with digital storage devices. Scanners and appropriate software for converting the valuable printed material to digital form is acquired for the Preservation section.

- Reference Section should provide access to need based information. Internet and Online facilities will help the user to access most of the information they need. This section should be strengthened with latest information resources with faster access to connect other libraries.

- The Textbook section with computerization can provide improved services. The much sought after texts can be digitized for wider access to many at a time. Access to such material can be from any computer in the library. If it is necessary to provide access to outside, proper licensing needs to be taken from the publishers.

- Textbook section supports the students to supplement their classroom learning. Hence, it is necessary to identify the materials and also update continuously to strengthen the collection with computer based information resources.

- Network access with other libraries will help the students to locate the materials. The library should strengthen the Document Delivery Service (Inter-library Loan) to serve the student community.

- Students of Distance Education can benefit, if the course materials are made available in digital form for consultation.

- Library can improve its front-end services to the users by introducing Bar-code system for all transactions in the library. Users including the library staff can be provided with the Bar-coded ID card to quicken the process and also to accurately capture data of each transaction.

- Bar-coding the library material will enable the library to improve the process in circulating the materials and in the stock verification work etc.

- The Online Public Access Catalogue will simplify searching the library materials, its status and reservation facility, if the material is on loan etc. Further, the computerization of card catalogue will enable the user

to locate and retrieve accurately the required books available in the library.

- Users can also download available information in a ready to use bibliographical format.
- Computerized libraries can actively participate in the Resource Sharing activities and can use their limited financial resources in more meaning ful way by avoiding duplication.
- The Branch Libraries can be connected online with the Main Libraries and the Users can have borrowing facilities from any library with the Barcoded ID cards.
- The public libraries in the state can be networked using the States Network backbone to effectively share the valuable information wherever it is located.
- Public libraries over the State could become dynamic Information Centers with rich information sources of each district sharable by the user across the State.

8. Conclusion

The fact is that our libraries and the library professionals still adhere to the traditional commitment to provide library service to the users with a view to educate and impart knowledge to them, essentially through printed materials. In order to improve efficiencies, librarians should introduce modem methods of organizing the materials and render services. Librarians should understand that public libraries are the only effective institution to support formal and adult education to the people in general, and to provide knowledge, information and intellectual recreation to them. Librarians should strongly feel that the real work is not only with books but also with people.

National Digital Library of India: An Overview

I. C. Bandi

1. Introduction

Information Technology is pervasive and also dynamic in nature. India is one of the technologically developed nations and most of the information sources are gradually being published in digital form. The advantages of digital sources have made an impact on the role of library and information professionals as well as end-users. National Digital Library (NDL) formation in India is very necessary and also important to cope with the technological developments in generation and utilisation of information. The NDL is the place to provide the required documents directly to the users on the screen enabling the users to interact with digital information. NDL can revolutionise information dissemination with respect to access, speed and availability. The greatness and success of NDL depends more on the strength of its services and its ability to connect electronically with other important national and regional libraries in the world. The evolving and emerging trends in the application of digital media and ubiquitous distribution of information are compelling the libraries to undergo a substantial structural change. The basic concept behind the NDL is storing and sharing the resources globally for providing right and nascent information to the nation at the appropriate time.

The recent advances in Information Technology and exponential growth of data in digital form have created an intensive interest in techniques to assist the users in locating the desired data. NDL is a structured storage environment of digital data with a consistent format for index and content abstraction.

The goal of NDL initiatives is to dramatically advance the means to collect, store, organise and use widely distributed knowledge resources containing diverse type of information and contents stored in a variety of

electronic forms. NDL requires a lot of attention and funding which resulted in many projects and studies.

2. National Digital Library: Aims and Objectives

- To preserve and conserve all the significant literature, artistic and scientific works of mankind in digital form
- Acquisition of material concerning the country wherever it is published and also acquisition of this record of information that may be available outside the country
- Digitisation of rare collection of national importance
- Development of network of important digital libraries in the country
- Acting as a professional body to the library science professionals in developing IT skills among the working librarians in the country
- Rendering digital bibliographical and documentation services of current and retrospective materials both in general and special

3. Why National Digital Library?

- A national digital library collection helps in preventing duplication of efforts and wastage of scarce resources.
- National digital libraries have the ability to enable worldwide access to a never-ending supply of distributed information, which is constantly and conveniently available and updateable.
- National Digital Library supports propagation and integration of nascent information. Multimedia and communication through networking (Internet) are two most significant components of digital libraries.
- National Digital Library sources will support distance learning, comparative study and training staff that needs reference.
- National Digital Library helps to avoid duplication in generation and collection of data by different agencies.
- More than one person can use digital materials simultaneously.
- It helps link with other texts through hypertext linkage. Digitised objects can be linked to other objects on the www allowing users to jump from one resource to another.

4. Functions of National Digital Library

- Content creation, storage, search and access, retrieval and preservation are important activities of the National Digital Library.
- National Digital Libraries are to generate
  a) new type of information resources

b) new approaches to acquisition, classification and cataloguing and ensure the

c) intensive use of electronic systems and networks and dramatic shifts in intellectual, organisational and electronic practices.

- It evolves into an active medium of communication, which affects social work and information seeking behaviour of the nation.
- It has the ability to preserve and extend information for the next generation.

5. Characteristics of National Digital Library

- National Digital Library will store the information in digital form.
- Usage of communication networks to access and obtain information
- Collecting information by either downloading on-line/off-line from a master file
- Preservation, search and access, content creation and delivery are the phenomena
- Reduced barriers of distances, timeliness, shared resources and content delivery

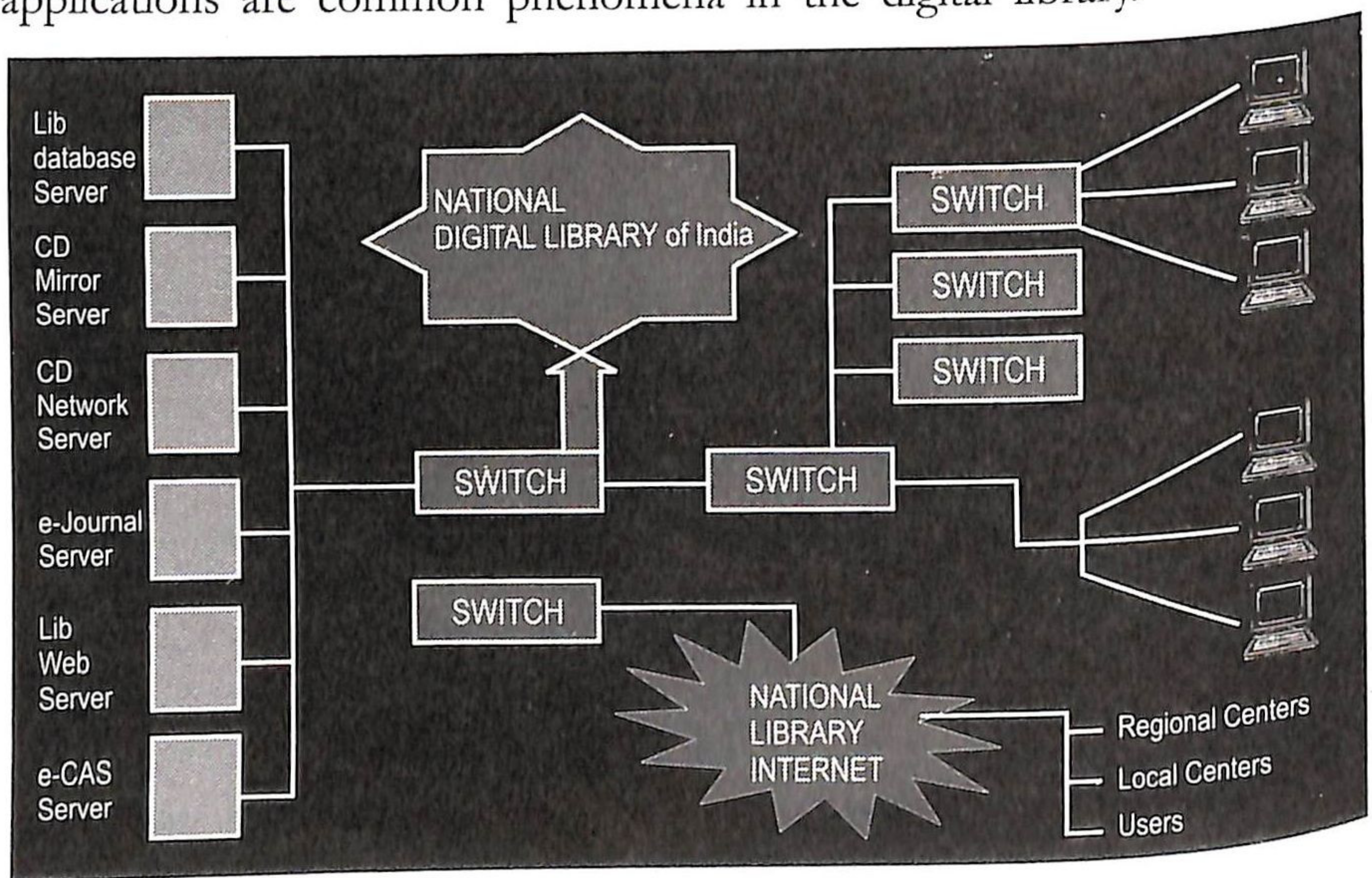# 6. National Digital Library Services

- Depository and repository of digital information sources
- Sharing digital information through networking
- Bibliographic control, translation, indexing, etc
- Consultancy/training service to the library professionals
- Centre for cultural and technical heritage of the country
- Handling E-mail questions, making special interested groups, and providing on-line FAQ's files. Conducting workshops and conferences may be common activities in the NDL. Apart from these services some personalised services to the end-users in which the following methods are most appropriate:

- **E-CAS (Electronic Current Awareness Services):** CAS is a very much older concept in our traditional library and it includes some of the important services like SDI, Newspaper Clipping Service and Translation Service. These Services can be provided to the users in an effective way by means of E-mail facility. This is possible by creating E-profile to the users. E-profile may consist of user profile, document profile and matching up profile. The information is composed, which is tailor-made. This new form of information will be supplied to the needy.

- **Web-OPAC/ Web Publishing:** Web-based Online Public Access Catalogue is most important among the personalised services in the library. This service is very common in all digital libraries. This service is used to search and locate the documents. It also gives details such as how to get the status of the documents. In this service the user can obtain the bibliographic information with its details of availability. In this modern information era interface is fully based on Internet technology. Today's users have simplest access to Web-based information through so many retrieval software. There are a number of Web browsers like Internet Explorer, Netscape Navigator, etc which can serve the purpose. The server side requires Web servers like Apache and Scripting languages like PHP, Java, etc for Web publishing.

- **Client Server Solution:** Some of the information resources are not Web-based. Some of the vendor solutions are client-server model-based. This type of information resources requires the user to install separate retrieval software. The reasons for this are, a) to have the protection against contents (copyright) and b) to have a control on number of users. Difficulties in maintenance and upgradation problems are prevalent in this approach.

7. Requirements

7.1 Networking

The use of network in the modern library in its automation and other IT applications are common phenomena in the digital library.

National Digital Library Network

7.2 System Requirements

The system side requirements can be viewed as Hardware and Software Requirements.

7.2.1 Hardware

The capable and adequate servers with enough processors, memory and other resources must be procured for hosting different E-resources. NDL should have more than 8 servers with Pentium III processor with high-speed memory for different E-collections, E-applications, and Library Automation services. CDM (CD Mirror) server and Samba-based CD servers will be the new additions for hosting CD-images for scientific databases. From the client's side, a Pentium PC with minimum resources is required which must be connected to the network so as to have the desktop access to vital information resources from the library easily.

| Summary of System Specification for National Digital Library	
Hardware Specification	Software Specification
Server Side Pentium III server (Dual processor) with 1 GHz clock, 256 caches 1 GB RAM and SCSI Hard disk, 52x CD Drive, All ion CD Mirror Server with 120 GB IDE, HDD and High Speed Network card. *Client Side* Pentium III/IV machines with Min. 32 MB RAM, 4GB HDD, 8x CD and DVD Drives.	Red Hat Linux OS 7.1, MYSQL Apache Web Servers, Samba, Java Server, PHP, MS-Access, Internet Explorer, Netscape Navigator, Adobe Acrober Reader 4.0

7.2.2 Software

Content creation, archival, retrieval and their publishing require a set of software packages. Linux Operating Systems offers several packages to host E-collections. It gives a free database management package MYSQL for archiving E-documents and Apache Web server for hosting E-collection. Samba is another popular tool offered by Linux that can be used for CD-ROM Networking. The client side generally does not require any special software other than the Web browser like Internet Explorer, Netscape Navigator. Software tools and development kit can be freely downloaded.
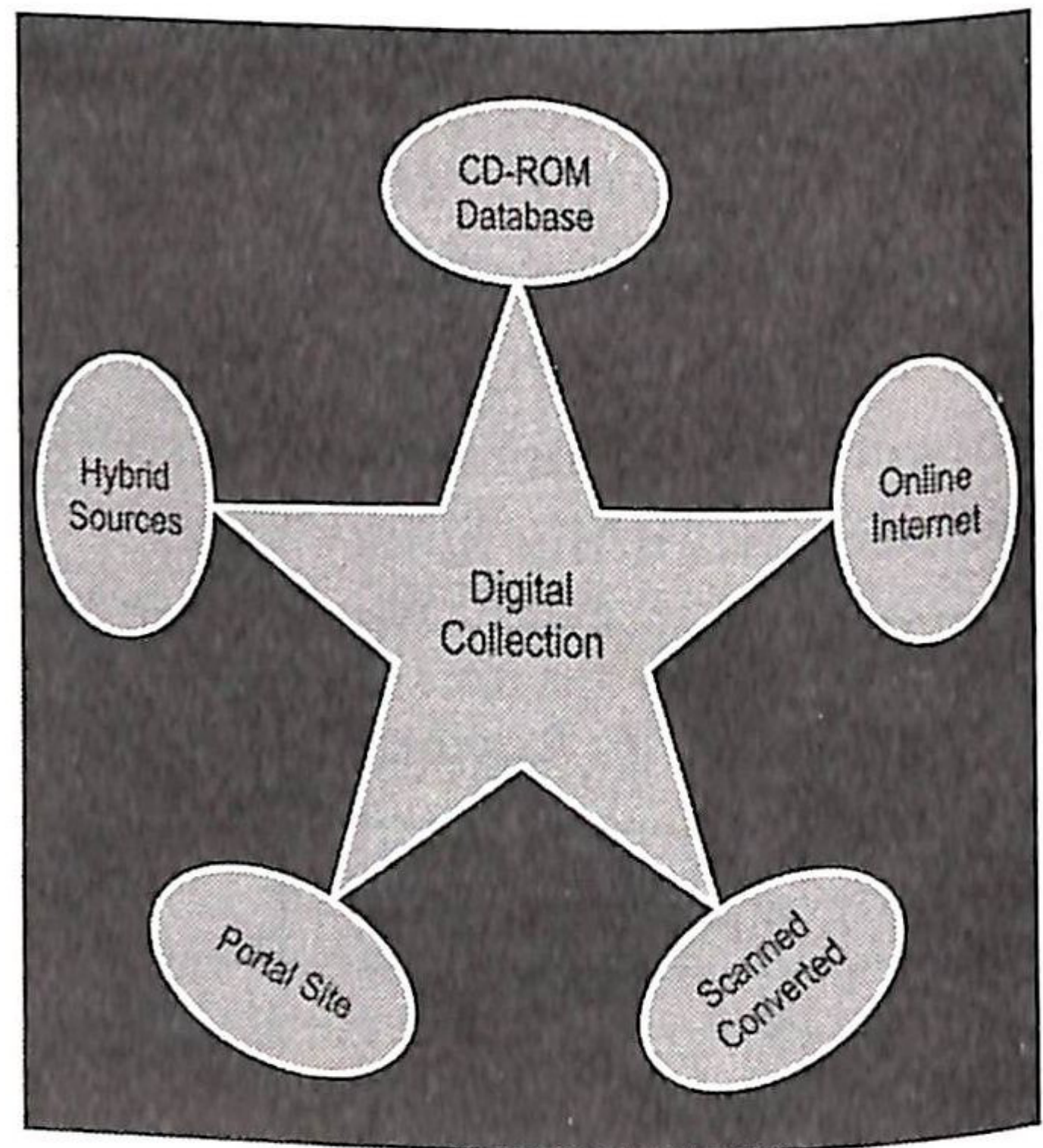
7.3 National Digital Library Collection

National Digital Library collection mainly depends on the donation and gifts by the digital information publishers in India and about India from anybody in the world. This collection can be developed and divided into the following types:

CD-ROM/Databases, Online resources, Scanned resources, Portal sites, Hybrid sources
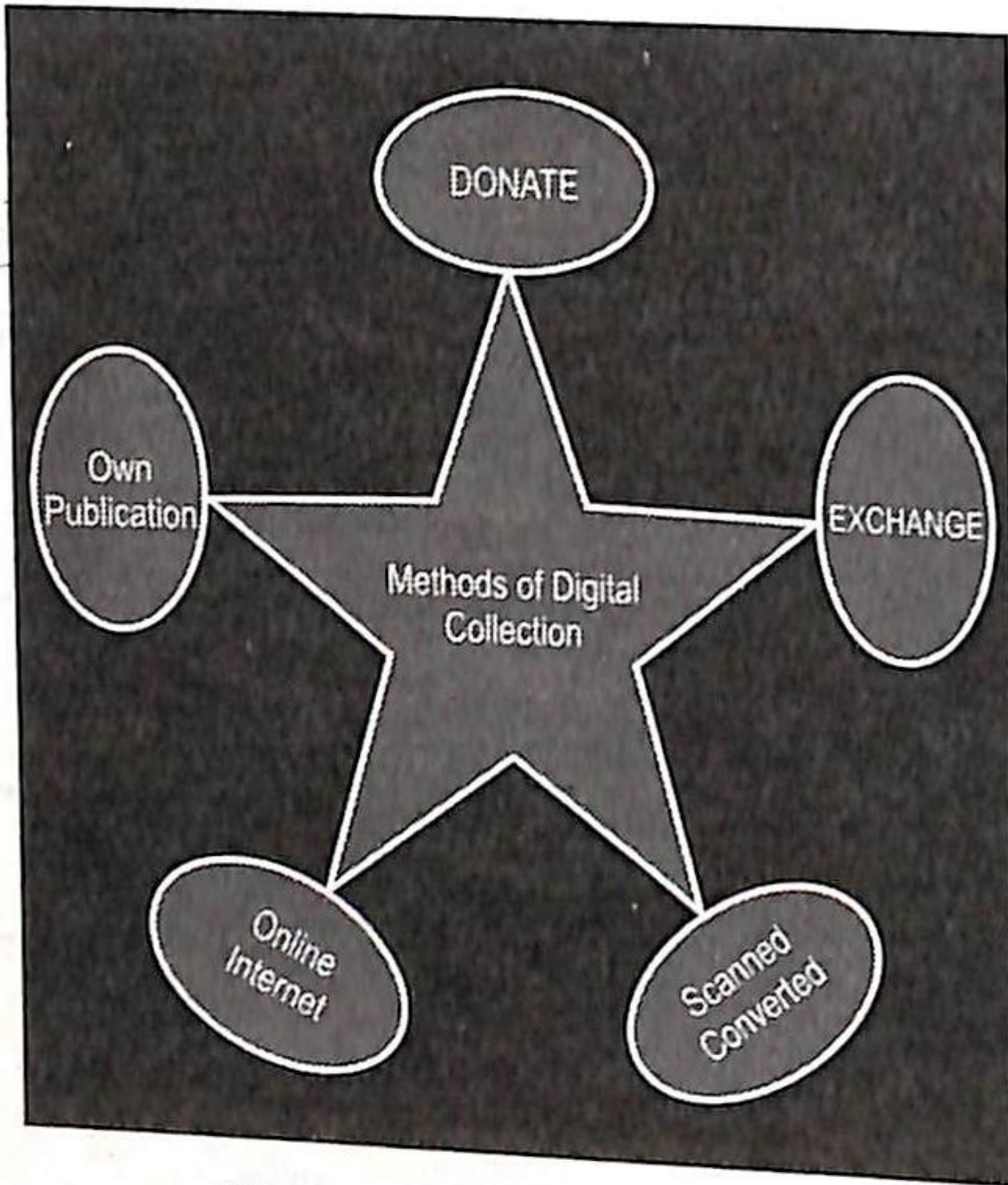
National Digital Library Collection Methods

View of National Digital Library Collection

- **CD-ROM/Databases:** Several full-text databases are publishing in the form of CD-ROM/Database and are very important sources in the digital library. CD-ROM networking technology is one of the popular methods to make multiple accesses on LAN, MAN as well as on Web. This is an important source in the collection of National Digital information sources. The CD-ROM's collection includes books, research works, and projects done in the country and about the country by anybody in the world. These types of digital sources will be donated to the National Digital Library. To build the collection the most important step is to make mandatory for holders to donate arty digital source, which is of an educational purpose, to the NDL. This can be possible by the Digital Document Act in India.

- **Online Resources:** Most of the Indian popular publishers' publications are in electronic version and many are available on Internet full-text free of cost. NDL can make use of these sources by downloading from the Internet. There should be a law, which can

help in getting free access to the online sources published in the Internet in the country and about the country anywhere in the world.

- **Scanning:** Scanning is one of the important activities in digital collection development in the National Digital Library. To cope with the modern IT application most of the important information sources can be digitised such as manuscripts, maps, slides, and one's own publications. National Library bibliographic publications can be made available in digital forms, both nascent and archives, by scanning the print documents.
- **Portal Site:** Portal means a gateway or entrance. We can include addresses of Websites, which are of interest to our readers of the National Library that users may come across these sites. If the user is interested to visit a site, he can directly click the address and he will be connected to that site. In this way our library can act as a portal site.
- **Hybrid Method:** By using these methods a database can be developed and user purpose can be served with digital information.

8. Standards and Protocols

At present the digital sources are available in various forms, formats and through different access points. This raises citation problems when the same material to be standardised to enable the end-user to retrieve information irrespective of the make of the machine. A common command information retrieval language which can work with any sort of computer and retrieval software may be useful in such situations. The following are some standards and practices that can be used in a digital library;

- *Data Handling and Interchange*
  Graphics Formats- JPEG. TIFF, GIF, PNG, Group4 Fax, CGM Structured Documents- PDF, SGML, HTML, XML Moving Pictures/3D- MPEG, A VI, Quick Time, Real Video, Vivid Active, VRML
- *Metadata*
  Resource Description- Dublin core, WH0 IS++, Templates, US-MARC, TEI Headers, other Open Sources and Domain Specific Standards.
  Resources Identification- URN, PURL, DOI, SICI
- *Security/Authentication*
  Emerging E-commerce standards

- *User Interface*

  Internet Explorer, Netscape Navigator or any common Web Browser can be used in interfacing the digital data.
* *Cataloguing and Classification*

  MARC-21, CCF, DDC, UDC
* *Retrieving Document*

  Z39.50 protocol can be used to retrieve relevant metadata from the catalogue records.

It is important to remember that standards are regularly reviewed and considered for reaffirmation, revision or withdrawal. Each revision supersedes the previous edition, making it imperative that the users ensure that any standards are of course the responsibility of the user and standards routinely include disclaimers to this effect.

9. Digital Library Issues

In spite of integration and updating of IT and maintaining a fair balance between print-based and digital information, some issues will arise which are:

1. Education and training of the professionals and end-users of the digital library
2. Issues related to copyright
3. Privacy and multilingual aspects of information
4. Active collaboration between libraries, publication bureaus and computer centres in universities, as well as, between public and private sectors across the globe
5. Problems of as integrity, authenticity and stability of published data.

Section 107 of the Copyright Law includes illustrations of potential fair uses and describes four factors that must be taken into account, they are:

- Character of the use
- Nature of the material to be copied
- Amount and importance of the part copied
- Effect on market for permission

Fair use of electronic sources also applies to

- Making copies of copyright works
- Making derivative works (digitisations)
- Electronic distribution
- Displaying and performing works publicly

To overcome these problems, many projects are underway. The ISI Electronic Library Project is developing a security and rights management system, which will take care at the client, and local and central server levels. The system provides secure viewing through session encryption and water-

mark, guaranteed document authenticity by means of digital system fingerprint and user privacy. But National Digital Library may have all those documents, which are donated or exchanged from the publisher. Hence these problems may not arise with the NDL sources.

10. Conclusion

National Digital Library will act as a bridge between digital sources and its users. In this present context a country like India should have a National Digital Library. Collection development and services of this NDL can be made available all over the country by means of networking with the regional centres located in Mumbai, Chennai, and New Delhi. Role of this NDL can be made very effective by conducting training/workshops, conferences of the working librarians in the country. Formation of NDL in India will be an important task in the field of library and information science.

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Applications of New Information Technology in Libraries and Information Centres

Jagdish Arora

1. Introduction

The past three decades have witnessed unprecedented developments in computer and communication technology. Computers are being used increasingly to automate various activities in libraries with a suitable off- the-shelf general or specific-purpose software package that are now available in a wide range. Tremendous storage and processing potential of computers are being fully realised through existing communication and networking technologies. The two technologies are interdependent, inseparable and share a symbiotic relationship. The computer's ability to store and process vast amounts of information and communication technology with its ability to transmit this information from one location to another converged to form "information technology" or "informatics". The information technology refers to a mosaic of technologies, products and techniques combined to provide new electronic dimensions to information and retrieval activities. The term information technology represents convergence of three strands of technologies, namely computer, microelectronics and communications. Information technology is used to describe products and services that came up with rapid changes in computer and communication technologies and their fusion. Thus, technologies which improve the efficiency and effectiveness of an information system or service falls under the purview of information technologies. Some of these information technologies are available to the libraries for many years, while a few are now emerging as important tools for overcoming the barriers in the access and dissemination of information.

The emergence of Internet, particularly the World Wide Web (WWW) as a new media of information delivery, coupled with availability of powerful

hardware, software and networking technology has further triggered large-scale commercial and non-commercial digitisation programmes the world over. Increasing number of publishers are using the Internet as a global way to offer their publications to the international community of scientists and technologists resulting in large-scale appearance of STM electronic journals on the Web. The Internet and Web technology provides an unparalleled media for delivery of information with greater speed and economy. Moreover, the Web-based electronic information products not only eliminates paper, physical storage and transportation costs, it also offers a hosts of other possibilities for incorporating multimedia and hyper-link features to electronic documents hitherto impossible on paper media. The Web-based electronic information products are exerting ever-increasing pressure on the traditional libraries, which, in turn, are committing larger portions of their budgetary allocation for either procuring or accessing

Web-based online or full-text search services, CD-ROM products, online databases, multi-media products, etc. The libraries and information centres, as consumers of electronic journals and online databases, are benefiting greatly from this technology-driven revolution. The information products of technological revolution, in turn, triggered major shifts in the traditional practices and policies of buying, storing and accessing journals.

Rapid changes in information technologies during the past three decades have drastically changed the functions and activities of information professionals in libraries. Most functions in modem libraries are being performed using software packages that are now available off-the-shelf. Several libraries have their catalogues available on the Internet with a Web-based search interface along with links to resources either acquired through external agencies or created in-house. Most libraries are on the Campus network with CD-ROM networks put in place to serve the information requirements of their academic community. Several libraries have taken up small-scale digitisation projects as part of their collection. The librarians and information professionals are required to develop skills that are required to use, develop and maintain IT-based services and products used by today's libraries. The article deals with new information technologies, their applications in libraries and their products and services. It describes Web-based library services which are modified versions of existing services and technology-driven new Web-based library services.

2. Need and Purpose of Information Technology in Libraries

The application of Information Technology in libraries results in increased operational efficiency. The IT increases productivity of library staff. It relieves professional staff from mundane jobs that involves a lot of

duplication so that they can be fruitfully used for user-oriented library services. It improves quality of services rendered by the library. Use of information technology ensures ease of functioning, accuracy and economy in human labour with greater speed. The exponential growth of information has made the manual system redundant giving way to computerised information storage and retrieval tools. Effective and efficient handling of huge quantum of information is only possible by using computers, which have the added advantage of being highly accurate and efficient that adds value to information.

Moreover, the technology also helps in rendering services that were hitherto not possible using traditional means. The new information technology facilitates improved management of physical and financial resources. The advances in technology and its availability at lower cost, has also raised expectations of users from librarians and libraries. The new information technology, on one hand, facilitates wider access to information for the library users, on the other hand, it facilitates wider dissemination of information products and services generated by the library. The availability of networks facilitate resource-sharing and high-speed communication with other libraries.

3. Library Automation

The library automation refers to computerisation or mechanisation of all library activities. It deals with the design and development of processes and systems that minimise the necessity of human intervention in their operations. The library automation is defined as "integrated systems" that computerise an array of traditional library functions such as acquisition, cataloguing, circulation and serials control, etc. using an integrated library software. A computerised library and information system is a set of functional system encompassing:

- In-house operations of the library; and
- Other applications of the information technologies in libraries including information storage and retrieval

An automated library is one where a computer system is used to manage one or several of the key functions of a library such as acquisitions, serials control, cataloguing, circulation and the public access catalogue. An integrated library system or an integrated online library system is used for computerisation of in-house activities of a library. Such application packages use a single biblio-graphic database and a set of interrelated application programs to support multiple library operations. Most integrated library packages are modular in design consisting of a number of optional and basic modules. Most library packages typically incorporate modules for: Acquisition, Cataloguing, Circu-lation Control, Serials Control and Public Access Catalogue. Online Public

Access Catalogue is often a principal motive for the implementation of an integrated library package. Several off-the-shelf packages are available in the market that can be used for computerisation of in-house activities of the library. These software packages are available for single users in a workstation mode (Windows 95/98/2000) as well in simultaneous multi-user environment on Windows NT / Unix / Linux / Sun Solaris Operating Systems. LibSys, Alice for Windows, Slim +, VTLS, etc. are some of the important software packages available in India.

4. Automatic Identification and Data Collection Technology

4.1 Bar Code Technology

Bar code technology is being used in library and businesses for the past 30 years to minimise data entry errors, speed processes and reduce costs. Most 306 ICONLIS2004 books, journals as well as other consumer products in the market carry black and white thin and thick strips. These black and white strips are known as barcode. Barcode technology offers a mechanism that can be used for identification, location and tracking of items that are bar coded.

Barcode is not a new technology, it was introduced in 1940 although it was first applied commercially in the 1960s as a method for tracking rail road cars. Since then, it has been used extensively in the consumer industry, material handling, industries and libraries. A barcode is a machine-readable code consisting of a series of bars and spaces printed in defined ratios. Bar code symbologies are essentially alphabets in which different widths of bars and spaces are combined to form characters and ultimately, form a message. Because there are many ways to arrange these bars and spaces, numerous symbologies are possible. Common linear symbologies include UPC/EAN, Interleaved 2 of 5 (I of 5), Codabar, Code 39 and Code 128. While each symbology is in some way unique, the composition of a complete message (bar code) is regardless of the symbology used.

Barcode by itself, is not a system but is an identification tool that enables accurate reading of data for sophisticated management systems. Use of barcode increases accuracy in data collection, saves time and brings about efficiency in library activities.

Bar code technology is being used in libraries all over the world especially for circulation of books as well as for several other functions. The Bar code technology has several other applications in the library including location control or book tracking, stock verification, receipt of issues of journals, cross checking of documents issued from the library, etc.

4.2 Radio Frequency Identification (RFID)

RFID (Radio Frequency Identification) is a term used for a radio-

enabled device that communicates with or interrogates a tag or smart label, which is embedded with a single microchip processor and an antenna. The origin of the term lies in the invention of "tags" that reflects back or re-transmits a radio frequency signal. The two components of RFID are tags and readers. The tags or label is equipped with a single microchip processor, an antenna and an ID code that can be embedded in almost any object. RFID readers are radio-enabled devices, that communicate with or interrogate RFID tags or labels wirelessly and obtain the ID code on the tags from a distance of several inches. The RFID readers can be fixed or made portable just like barcode scanners. RFID can also be referred as a high-tech version of the barcode.

In the past few years, the cost of RFID tags have come down drastically. Low cost RFID tags typically cost less than Rs. 50 each for up to 1 metre range making the technology affordable as an alternative to the barcode, magnetic strip or printed label. RFID has advantages that include tolerance of mis-orientation and obscuration, lower cost over life and ability to "read". Most importantly, RFID tags are cheap enough to be disposable and thin enough to go even inside the sheets of paper in some cases.

4.2.1 How it Works?

An RFID tag is a means of storing and retrieving data through a radio frequency transmission to the chip inside the tag. An RFID tag is simply an integrated circuit (chip), which includes memory for data storage and a sub-strate backing material with an antenna pattern. The chip can typically hold up to 1,024 bits (128 bytes) of information. In a typical library implementation, each book is equipped with smart labels and library patrons are given library cards imbedded with smart labels. Tags, or smart labels can be programmed to store i) unique accession number of documents; ii) class number of a document; and iii) a unique security code for EAS.

While accession number is used for carrying out functions of circulation, stock verification and other library applications, class number can be deployed for sorting documents according to class numbers and segregating them into bins for different shelving areas. As mentioned earlier, the RFID tags can also be used as antitheft devices in libraries. Such applications of RFID are called Electronic Article Surveillance (EAS). New forms of RFID performs EAS functions as well, obviating the need for a separate device.

An interrogator, or reader, is a radio frequency device used to write data to and read data from the chip. Smart tags used in a library are passive, having no internal power source such as a battery. The interrogator provides enough RF energy to power and activate the tag to reflect or to present information stored on them.

RFID tags transmit data, antennas receive or transmit the RF signal through the air and readers decode the RF information received from the RFID tag through the antenna. The data is then transmitted to the host application for necessary processing.

In a typical library application, RFID readers can be installed at various strategic places to support different functions that RFID tags can perform. Some of the typical installations could be:

- Workstation designed specifically for library staff to facilitate the smooth handling of books and other material having RFID labels/ tags.
- The security gates with Theft Detection System (AES). Any item that has not been checked-out either by staff station or self check-out station, will be detected as it goes past these pedestals.
- Self-service station with provision for checking out books independently by the borrower without any intervention of library staff. The theft detection system of the smart label for that book is deactivated to enable smooth passage from the security gate.
- "Drop Box" where returned books are placed through suitable slits by patron themselves. As books are returned through the Book Drop facility located suitably in a library, the smart labels are automatically read, and both patron record and Library database gets updated.

5. Office Automation and Computer-based Electronic Message System (CBEMS)

Libraries, besides using integrated library packages, also use office automation software like word processing (MS Word or Word Pro), spreadsheet (MS Excel or Lotus 123), database management systems (MS Access or Lotus Approach), presentation packages (MS Power point or Lotus Freelance Graphics) and graphic applications (Photoshop or Paintshop). Librarians and information professionals, therefore, require basic training in use of such general-purpose packages.

Similarly, libraries also use computer-based electronic message system while attending their day-to-day routine work. A computer-based electronic message system (CBEMS) allows communication between computer users hooked into a network. A message or a unit of communication is sent by its originator to one or more recipients. CBEMS is used for communication between person-to-person, human-to-machine and machine-to-machine. A document or message sent through the electronic system may contain text, graphics, image, speech as well as other types of information.

All local, national and international communication networks offer CBEMS facilities. A computer-based system used for sending a message or document may have facilities to create, edit, file, receive, transmit and print it electronically. Fig.1 shows services categorised as Computer-based Electronic Message Systems:
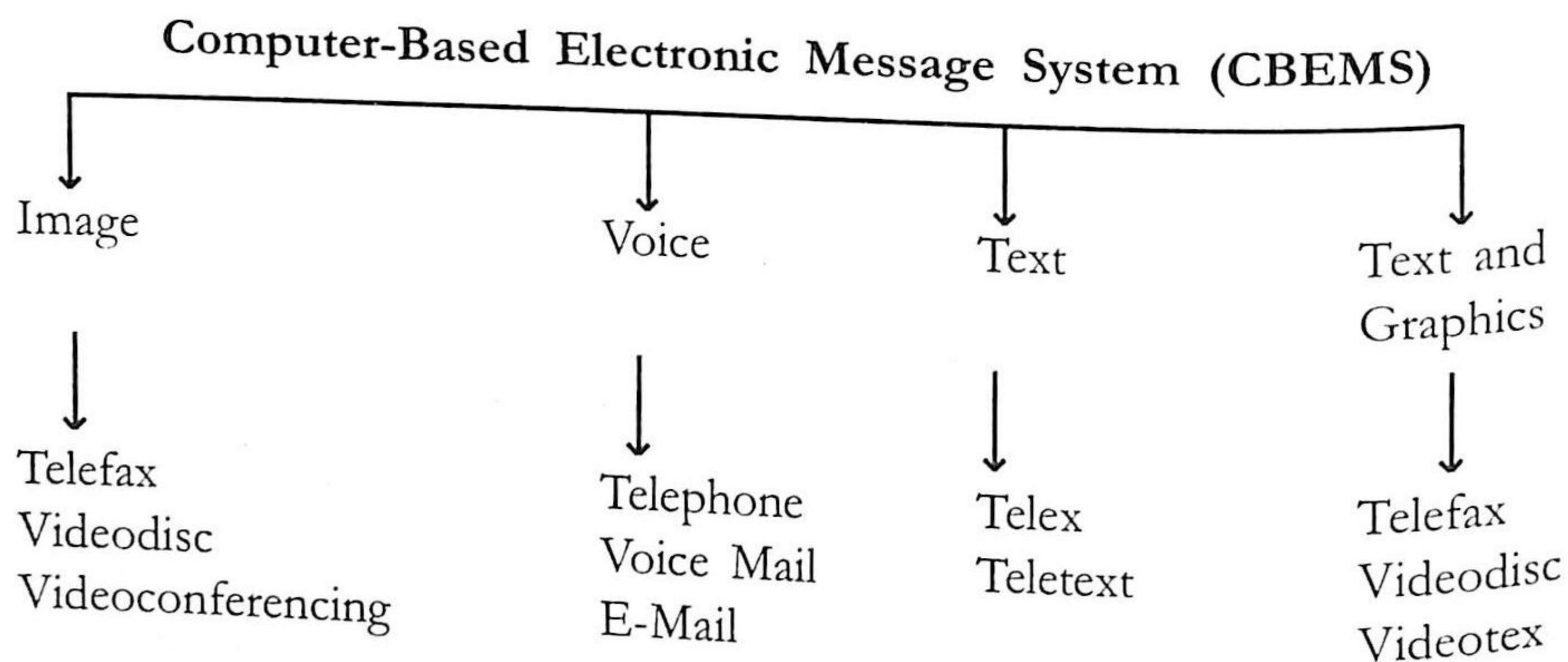
Computer-Based Electronic Message System (CBEMS)

Image	Voice	Text	Text and Graphics
Telefax	Telephone	Telex	Telefax
Videodisc	Voice Mail	Teletext	Videodisc
Videoconferencing	E-Mail		Videotex

Fig. 1: Computer-Based Electronic Message System (CBEMS)

Computer-based electronic message handling offers many advantages over its conventional counterparts. The system improves the information flow process and does not require the presence of two communicating parties simultaneously. A group of persons working on the same project geographically dispersed over a large area can communicate with each other using CBEMS. Some of the important CBEMS modes of communication are given in Figure 1 above.

6. CD / DVD ROM and their Networking

CD-ROM technology uses hand-size, circular plastic platters made from polycarbonate with a shiny underlay that stores digital information optically. A typical disc used in a computer-based CD drive stores 650 MB using 333,000 sectors. All sections and sub-sections can be digitally labelled, located and read, but not altered by the user. CD-ROMs come with data already encoded onto them. The data is permanent and can be read any number of times, but cannot be modified. The CD-ROM drive's nominal speed is the same as its transfer rate. Single-speed drives have a 150 Kbps transfer rate while the rate for 12x drives is 1.8 Mbps. 48x and 52x drives are now available in the market.

Writable CD-ROMs are now available as WORM (write-once, read-many). With a WORM disk drive, the disk can be read and reread but once it is recorded it cannot be changed. Data on Erasable-Optical disks (EO) or CD-re-writable disc can be erased and loaded, just like magnetic disks. An optical disk drive reads and writes data onto the disk using laser.

Digital Versatile Disk or DVD, initially stood for Digital Video Disc. Like a CD, DVD is an optical storage system for read-only, recordable and rewritable applications. But, being similar to a CD in many ways, DVD is considered as potential replacement for CDs.

The DVD format provides several configurations of data layers, moving from 2D storage to 3D storage. Each configuration is designed to provide additional storage capacity. The similarity between the DVD and the CD gets smaller with each upgraded configuration, DVD-5 utilises two layers to store the information and two laser beams to retrieve the data. Even higher storage capacity is achieved in DVD-9 by going 3D. The first layer is semi-reflective in DVDs, which allows the second beam to reach the second layer, which is fully reflective. Likewise in three-layered DVDs three laser beams are used to retrieve data, while the first two layers are semi-reflective, that allows third beam of laser to reach the third layer to retrieve the data. The disk is made by bonding together two 0.6 mm thick substrates using transparent (with no internal defects or bubbles) UV-cured (UV = ultra-violet) lacquer. This disk design allows almost twice as much data to be stored as DVD-5. Labels are printed on the other side of the disk conventionally.

The libraries are acquiring CD-ROM-based information products in increasingly larger numbers. Networking CD-ROMs is essential to facilitate simultaneous access to these CD-ROM products to multiple number of users. The benefits of networking CD-ROMs include easier management, installation, configuration and updates, and better security. They also offer cost savings in hardware and network software licenses and ultimately, higher user productivity and higher performance. The CD-ROM networking solutions available in the market includes i) plug and play mini-server; ii) dedicated CD-ROM servers; iii) Hard disc-based CD-ROM servers (and iv) Silver Platter's Electronic Reference Library (ERL).

7. Multimedia Applications

Multimedia is a combination of some or all forms of knowledge representation such as text, data, images, photographs, animation, audio and video, that may have been converted from different physical formats into digital media and is delivered by computers. Unlike the analogue media such as TV programmes, the digital media allows users to manipulate the data according to their requirements, use it at their pace, and interact with it at any point of time. When a multimedia program is developed in a hypertext environment, the resulting product is called hypermedia. Multimedia is, therefore, a part of hypermedia. All hypermedia products are multimedia products but not vice versa. The hypermedia, like Web, is non-linear in its presentation, it is Web-based where links for different media are embedded into a hypermedia

presentation. The multimedia, on the other hand, is organised linearly. The main constituents of multimedia are as follows:

i. Text: information about an object/ event, etc. notes, caption, subtitles, contents, indexes, dictionaries and help facilities

ii. Data: tables, charts, graphs, spreadsheets, statistics and raw data.

iii. Graphics: both traditional and computer generated (vector form) such as drawings, prints, maps, etc.

iv. Photographs and slides

v. Animation: including both computer generated, video, etc.

vi. Audio: including speech and music digitised from cassettes, tapes, CDs, etc.

vii. Video (digital): either converted from analogue films or created using a computer

A multimedia system records, processes, stores and delivers all types of information in binary code the same way as a computer does. This is quite different from the traditional analogue technology of radio, TV, audio-visual tapes, gramophone records, or the combination of digital audio and analogue video in interactive video discs. The main advantage of a digital format is the flexibility in combining, transmitting, manipulating and customising the elements of the multimedia according to the needs of the user.

Basically, a multimedia system is built around a PC with high-end graphic processors, a sound card (to play and record sound), CD drive and drivers for playing digital audio and video. Most systems these days are equipped with all the accessories listed above.

A wide range of application software required for developing multimedia and hyper media products are commercially available for all computer platforms. The most popular and inexpensive among them are HyperCard on Mac and ToolBook on PC. On the other hand, there are a number of authoring packages for high-end multimedia design. The popular ones include Macromedia's Director, Macromedia's Authorware (both Mac and PC platforms) and Icon Author for PC. HyperCard is a popular Hypermedia toolkit for Mac that was used extensively in libraries for designing various applications during the post 1980s and early 1990s.

7.2 Multimedia Applications in Libraries
7.2.1 Multimedia Library Tour

The multimedia is best suited for creating interactive multimedia library tours. Such Web-based library tour programmes can have a presentation with graphics and sound in the background. The multimedia library tour virtually takes

the viewer around the library, provides an effective orientation, guides them to collections, facilities and services, and presents a general layout and floor plans for the library.

7.2.2 Instructions/Training

The multimedia tools can be effectively used for providing training on using library resources. The multimedia tools provide interactivity to make instructional progammes more presentable. The libraries are required to impart training on the use of Web-based and CD-ROM databases. Web-based multimedia instructional training guides are useful to handle such requirements with ease sparing the time of librarians for other jobs.

7.2.3 Multimedia Databases

Besides its collections in printed format, the library also possesses a sizeable number of photographs, artifacts, audio recordings and textural material in its collections. Multimedia can be used effectively to integrate such diverse collections to bring out a single compilation having photographs, sound recordings, scanned documents, etc. Such compilations can be brought out on CD-ROM which will serve for archival purpose as well as for day-to-day use.

7.2.4 Multimedia Catalogue System

Interactive multimedia catalogues are electronic forms of catalogues distributed in mail order catalogues market. The multimedia catalogues offer a high volume of information on a small disk. Several international publishing companies are also bringing out their catalogues in interactive multimedia CD-ROMs.

7.2.5 Multimedia Information Resources

Several references works earlier available in print format are available as multimedia electronic information resources. Several such products are mentioned under "electronic publishing".

7.2.6 Multimedia Archival System

Multimedia archival system are mostly developed by the national museums, publishing houses and movie production companies. The museums bring out some of their star artifacts on multimedia CD-ROM for distribution.

7.2.7 Multimedia Use in Museum Libraries

Multimedia systems allow images, sound and text to be combined in imaginative new ways to be transmitted in digitised formats and be stored and

reproduced or networked for wide public access. The use of multimedia in museum libraries helps them to promote and increase public interest in their collections and to exploit resources for the benefit of further enrichment. The students, teachers and researchers as well as general public are greatly benefited with such initiatives;

8. Electronic Publishing: Products and Services

The term "electronic publishing" signifies the use of computers in the production of printed publications as well as publishing of material in a computer-accessible medium, such as on a CD-ROM as well as making information available through online services. Electronically published materials are not simply electronic text, it often includes multimedia blends of sound and image with text. The products and services of electronic publishing undergo frequent changes, sometimes in real time, with feedback from their users.

Online Public Access Catalogues (OPAC) as well as online bibliographic databases can only be used to find bibliographic details without their contents in full-text. This limitation leads to the demand for electronic publishing as a tool to develop full-text databases in digital forms. However, the 1990s brought in a true revolution in the digital library system with the advent of World Wide Web (WWW). The WWW offered Web server at the server-end and web browser at the client-end for all prevalent platforms. Standard WWW clients such as Netscape Navigator and Internet Explorer eliminate the need of extensive support and user's training. HTML, the de facto language of the Web, is an extremely simple yet powerful tool for presentation of Web-based IT products. The Internet and associated technologies, made it possible for Web-based electronic information products to include multimedia objects such as text, image, audio and video. These technologies thus brought in the graphical components to electronic publishing which were earlier missing.

Electronic publishing on the Internet manifest themselves in numerous flavours and categories, although most of them emulate traditional publishing while others are revolutionary in their design and approach. While the present trend to imitate and emulate the traditional models of scholarly communication may continue for some time, eventually the capabilities added by the new media would be used in more innovative ways. The information resources currently available via the Internet includes electronic conferences (variably known as electronic forums, electronic user-group, listservs, discussion groups, etc.), courseware, tutorials, guides, manuals, electronic journals, patents, standards, electronic preprints and E-prints, technical reports, electronic theses and dissertations, online databases and databanks, electronic books and print-on-demand, dictionaries, encyclopaedia, portal sites or meta resources. Librarians and information professionals should have knowledge of not only the exist-

ence of such resources but also options and methods to make them accessible for their users. Some of the important Web-based electronic resources are briefly described here.

8.1 Online Databases and Online Search Services

The idea of sharing information has led to the concept of online databases. A database is a non-redundant, multi-usable, independent and physically available set of data elements, stored in an organised and structured manner to allow the user to search the information in an interactive mode. The first databases were bibliographic in nature and were online versions of existing indexing and abstracting services such as Biological Abstracts, Index Medicus, Chemical Abstracts, etc. By the year 1988, only half of all databases were bibliographic. With introduction of a number of online databases containing textual information, news, statistics, commodity prices, etc. a third type of databases holding text of full-length documents started appearing. Several full text of encyclopaedia, directories and articles from selected journals are now available online. The number of public-domain databases available for searching is growing every year. Thousands of databases are now available on compact discs (CD-ROM) as well as on the Web.

The concept of online searching was originally used to describe the process of directly interrogating computer systems to resolve particular requests for information. Now the term is used to denote searches that are conducted by means of a local computer that communicates with a remote computer system containing data files. The search process is interactive and the user can make changes in the search statement until a satisfactory result is obtained.

Online bibliographic services are responsible for mounting databases on a computer and making the necessary arrangements for such databases to be searchable from a large number of remote user workstations. Online search services that provide access to a large number of databases convert the databases into a uniform format with standardisation so that the basic commands and search techniques can work across all the databases that are offered by a given vendor. Library professionals need awareness of the range of search services 'that are available and commands to be used for conducting a search. Most of these databases are available from several search services. For example, database INSPEC is available on DIALOG, STN, BLAISE and ESA-IRS.

8.2 Electronic Journals

Electronic journals or E-journals are those journals and newsletters that are prepared and distributed electronically. Electronic journals may be defined

very broadly as any journal, magazine, E-zine, webzine, newsletter or type of electronic serial publication which is available over the Internet and can be accessed using different technologies such as WWW, Gopher, ftp, telnet. E-mail or listserv. Several traditional journals are now being published both on the Web and in print. Current issues or content lists for most of the journals are available on the Web or distributed to subscribers as an E-mail text message.

Internet-based electronic journals started to appear at the beginning of 1990. These journals were mostly delivered as an attachment to E-mail while their back issues were mounted on anonymous ftp sites and, users were required to download them from these ftp sites. The libraries and information centres made them accessible through their gopher site. The year 1995 witnessed the peak of Gopher technology which then dropped suddenly and dramatically by 1997. With the advent of WWW technology in 1993, electronic publishing became more than a novelty, the Web as a means of delivery of electronic information has grown steadily since then. As publishers experiment with different publication modes and models, the very definition of a journal is undergoing change in the electronic environment. New journals have evolved based on the graphical capabilities of the Internet that are available only in electronic form.

With the advent of CD-ROM technology as an optical storage media in the mid-80s, several electronic journals started appearing on CD-ROM. The first major development in this direction were projects experimenting with electronic equivalents of printed journals. One of the oldest examples is ADONIS where images of articles published in printed journals are distributed on CD-ROM. Still older examples are full-text online journals offered by the major host organisations. Online hosts like DIALOG and STN were not only offering online databases but also full-text online journals for the past several years, although as a simple ASCII or text files without graphics and pictures. In 1989, there were almost 1,700 full-text sources available through sixteen online systems. All of these projects involve journals and all of them are by definition electronic, but these journals were not truly electronic, they can at best be described as electronic versions of printed journals.

The number of electronic journals has grown in dramatic proportion from less than 10 in 1989 to more than 8,500 in April, 2000. The 37th edition of the Ulrich's International Periodical Directory (1999) reports that of the total 1,57,000 serials listed in the Directory, 10,332 are available either exclusively online or in addition to their paper counterparts.

8.3 Electronic Books

An electronic book is defined as a portable hardware and software system

that can display a large quantity of readable textual information to the user and let the user navigate through this information. An E-book is digital reading material that a user can view on a desktop or notebook personal computer, or on a dedicated, portable device with a large storage capacity (1,500 to 50,00,00 pages) and the ability to download new titles via a network connection. More and more traditional book publishers, as well as those catering to the professional and business communities, are seeing the potential of digital publications and are working to ensure they enjoy a fair share in the market's growth. In fact, analysts expect the market for E-book titles and other electronic documents to exceed US$ two billion in the next few years.

The electronic book market consists of two distinct components i.e. i) electronic book consisting of digital material or contents; and ii) electronic book hardware including E-book reading appliance. The digital material or contents that makes an electronic book are simply textual and graphical files consisting of bits that can be transported on CD-ROM or other storage media or delivered over a network connection. It is designed to be viewed on some combination of hardware and software ranging from dumb terminals to Web browsers, on personal computers to the new reading appliances. Every electronic book cannot be viewed using any viewing technology. Some E-books use formats that can be viewed using specific viewing technologies only while others are most versatile and can be easily delivered to many diverse viewing environments.

A number of hardware options are available for using an E-book that includes: i) dedicated E-book readers; ii) PDAs and pocket PCs with book reading software; and iii) Hybrid devices. Rocket e-book, a paperback sized device that could hold about 10 books (4000 pages of text and graphics) can be considered as the first modern E-book reading appliance launched by the Nuvomedia in 1998.

PDAs and Pocket PCs are usually smaller than the dedicated E-book reader and primarily function as personal organisers. Often they also offer Internet access, word processing, spreadsheet and MP3 playing capabilities. With E-book contents and their viewing software becoming available for the PDAs and pocket PCs, they are increasingly being used for reading E-books. Palm Reader, MobiPocket Reader and Microsoft Reader are some of the E-book readers or viewer software.

Electronic books are also available on the Web either free or on payment. Project Gutenberg started digitising public-domain texts for download in 1992. The project has a team of volunteers for re-keying texts. It offers more than 3,000 public domain titles free. New kinds of businesses are now emerging on a new scale involving a large number of publishers to make thousands of books available online for libraries and individuals at relatively

lower cost. Three major companies that have recently emerged in this market are Questia, ebrary and NetLibrary. All three platforms offer E-books, journal articles and encyclopaedia articles besides other services as value addition.

8.4 Electronic Preprints and E-prints

Electronic preprints are research articles that are made available for distribution through the network in electronic format before they go through the process of peer reviewing. Ginsparg preprint archive (http://www.arXiv.org/), started in 1991, has become a fundamental means of communication for a growing number of fields, starting with theoretical high-energy physics, later spreading to other areas of physics, and now also to computer science and mathematics. Ginsparg's preprint archive is a sterling example of how technology can lead to a sudden, profound, and beneficial transformation. This archive processes 35,000 submissions every year, which is substantial, but small compared to around two million papers in all science, technology, and medicine areas published every year. It receives two-thirds of its two million weekly hits from institutions outside the United States, including many research facilities in developing regions. The archive has become indispensable to researchers world wide, but in particular to research institutions that would otherwise be excluded from the front line of science for economic and sociological reasons. The success and wide adoption of arXiv has prompted new thinking about the reform of scientific publishing in other disciplines. Scientists have become aware of benefits of open archiving, such as relief from high-priced journals, reduction of time in announcing research findings, and the provision of access to all interested researchers through the Internet. As a result, other E-servers have been set up and the movement to free scientific publishing from financial restrictions has been growing steadily.

"E-prints" is the term generally used to describe electronically mounted copies of the final, peer-reviewed versions of journal articles. Among the best known proponents of E-print developments is Dr. Stevan Harnad of the University of Southampton. Dr. Hamad advocates for authors to self-archive their published papers (postprints) which, if adopted widely, would lead to the ultimate removal of cost barriers for the exchange of publicly funded research information. These developments have generated much debate and a number of international initiatives have evolved to refine and standardise the archiving procedures. One important international movement is the Open Archives Initiative (OAI), which aims to develop and promote the use of a standard protocol, known as the Open Archives Metadata Harvesting Protocol (OAMHP), designed for better sharing and retrieval of E-prints residing on distributed archives. There are various forms of open archiving. The term "self-archiving" is often used to refer to the process whereby individual authors

submit their own papers to a server or archive of their choice. There are 'institutional archives', where authors submit e-prints to a server administered by an organisation or scholarly society, commonly their university or research institute; there are also discipline-based archives and other specialty archives.

The other information resources available via the Internet includes electronic conferences, courseware, tutorials, guides, manuals, patents, standards, technical reports, electronic theses and dissertations, print-on-demand, dictionaries, encyclopaedia, portal sites or meta resources. These resources are not described here because of limitation of space.

9. Digital Imaging Technology

Digital imaging is the process of converting paper documents including text, graphics, or pictures into digital images that can be made accessible over electronic networks. A digital image, in turn, is composed of a set of pixels (picture elements), arranged according to a pre-defined ratio of columns and rows. An images document file can be managed as a regular computer file and can be retrieved, printed and modified using appropriate software. Further, textual images can be OCRed so as to make its contents searchable. Digital imaging is an inter-linked system of hardware, software image database and access sub-system with each having their own components.

Several digital library projects are concerned with providing digital access to materials that already exists with traditional libraries in printed media. Scanned page images are practically the only reasonable solution for institutions such as libraries for converting existing paper collection (legacy documents) without having access to the original data in computer processible formats convertible into HTML / SGML or in any other structured or unstructured text. Scanned page images are the natural choice for large-scale conversions for major digital library initiatives. Printed text, pictures and figures are transformed into computer-accessible forms using a digital scanner or a digital camera in a process called document imaging or scanning. The digitally scanned images are stored in a file as a bit-mapped page image, irrespective of the fact that a scanned page contains a photograph, a line drawing or text. A bit-mapped page image is a type of computer graphic, literally an electronic picture of the page which can most easily be equated to a facsimile image of the page and as such they can be read by humans, but not by the computers, understably "text" in a page image is not searchable on a computer using the present-day technology. An image-based implementation require a large space for data storage and transmission. There are several large projects using page images as their primary storage format, including project JSTOR (www.jstor.org) at Princeton University funded by the Melon Foundation. The project JSTOR has a complete set of more than 120+journals scanned and hosted on web

servers that resides at the University of Michigan and is mirrored at Princeton University. Using technology developed at Michigan, high resolution (600 dpi) bit-mapped images of each page are linked to a text file generated with optical character recognition (OCR) software. Linking a searchable text file to the page images of the entire published record of a journal along with newly constructed table of contents, indexes, permits high level of access, search and retrieval of the journal material previously unimaginable (Guthrie, 1997).

Capturing page image format is comparatively easy and inexpensive, it is a faithful reproduction of its original maintaining page integrity and originality. The scanned textual images, however, are not searchable unless it is OCRed, which in itself, is a highly error prone process specially when it involves scientific texts.

10. Artificial Intelligence and Expert Systems

An expert system employs human expertise captured in a database to solve problems which usually require human expertise. It either supports or automates the process of decision making in an area in which experts perform better than non-experts. It is also known as "Expert Computing Systems", or "Knowledge-based Systems" or "Intelligent decision support systems". The expert systems use subject-specific knowledge in addition to general knowledge. They are know to perform well in specified subject area or problem area. The knowledge-based systems are flexible, which means that it can be modified arid expanded by adding or deleting from its knowledge base without the need for rewriting the program itself.

The 1950s and 1960s were the period when artificial intelligence was primarily concerned with the development of computer programs that could perform tasks that were considered to require a high degree of intelligence, e.g. games such as chess; theorem solving, etc. A key development during this period was the idea of heuristics, an important precursor to the advent of expert systems. Heuristics can be defined as guidelines for choosing among alternative actions. They can be used as shortcuts to direct the search for a solution along more promising lines, even if an optimal solution is not guaranteed. Another key development was the creation of LISP, a symbolic programming language.

The expert systems explosion of late 1970s and early 1980s was caused by the realisation that computer programs could perform useful tasks at expert levels of performance, if they were endowed with large amounts of specialised knowledge, and were constrained to narrow but real domains. Research in this period turned towards trying to clone human experts by capturing their experiential knowledge. Some of the successful expert systems of this period were:

- Mycin, a computer program designed as a decision aid for doctors, which when given data describing a patient's symptoms could diagnose infectious blood diseases and prescribe therapies appropriate to the disease diagnosed.
- Rl, an expert system used by Digital Equipment Corp., which when given a set of specifications of the computer system requirement of a customer would select the appropriate computer components and peripherals, check for inconsistencies, design the layout of the entire system and print out a detailed order.
- Prospector, a program to detect commercially viable ore deposits based on geological data.

These successes led to the idea of an expert system that had the basic structure in which rules could be entered, and the matching capability to make inferences based on the rules. The simplicity of this concept led to the rapid commercialisation of expert systems.. Thus, it was with the start of the early 1980s, that knowledge-based systems were applied to a wide variety of areas.

11. Internet Technology and Services

The Internet has revolutionised our society, our economy and our technological systems. Over the past century, important technological developments have created a global environment that is drawing people of the world closer and closer together. About fifteen years ago, most of the world knew little or nothing about the Internet. The Internet was then a private network accessible only to computer scientists and researchers who used it to interact with colleagues in their respective disciplines. Today, the Internet's magnitude is a thousand times more than what it was only a decade ago. It is estimated that about 60 million host computers on the Internet today serve about 200 million users in over 200 countries and territories. Today's telephone system is still much larger: about 3 billion people around the world now talk on almost 950 million telephone lines (about 250 million of which are actually radio-based cell phones). Also, the total numbers of host computers and users have been growing at about 33 per cent every six months since 1988 - or roughly 80 per cent per year. The telephone service, in comparison, grows an average of about 5-10 percent per year. That means if the Internet keeps growing steadily the way it has been growing over the past few years, it will be nearly as big as today's telephone system by about 2007.

The Internet has revolutionised the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for

information dissemination, and a medium for collaboration and interaction between individuals and their computers without barriers of geographic location. The Internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure. Beginning with the early research in packet switching, the government, industry and academia have been partners in evolving and deploying this exciting new technology. Today, terms like "Yahoo" and "Google" are a common part of our vocabulary.

11.1 World Wide Web

The World Wide Web known as WWW, W3 or simply, the Web — is one of the several Internet resource discovery tools developed to help people publish, organise and provide access to information on the Internet. The WWW can be defined as a hypertext, multimedia-distributed information system that provides links to hypertext documents, as well as to many other Internet tools and databases. There are several features that are unique to the Web that make it the most advanced information system to appear on the Internet to date.

11.1.1 Importance of the Web

The World Wide Web is important for libraries because it provides an extremely powerful method of organising and providing access to information. It can provide one interface to a large variety of network information resources and systems. With the Web and its browsers libraries can:

- electronically publish anything that they now publish on paper
- provide access to in-house hypertext documents or to hypertext documents available on the Internet
- create electronic orientation services with floor maps and descriptions of services
- provide access to Internet tools such as TELNET, gopher, FTP and WAIS through a single interface
- create interface to in-house databases or bibliographies
- collect information from patrons through the forms feature

With all its power, the Web is the most important tool towards creating electronic libraries. It provides a mechanism to present a wide variety of information resources to Internet users in a simple, efficient and effective manner.

Other important services offered by the Internet that the library and information professionals should be conversant with are electronic mail (E-mail), electronic conferences, news groups, remote login, telnet, File Transfer

(FTP), Gopher, Archie, Veronica, Wide Area Information Search (WAIS), Web Chat and Internet Relay Chat (IRC).

12. Digital Libraries

The increasing popularity of Internet, and developments in Web technologies act as catalyst to the concept of digital library. While the Internet serves as the carrier and provides the contents delivery mechanism, the Web provides the tools and techniques for content publishing, hosting and accessing. Today's digital libraries are built around Internet and Web technologies with electronic journals as their building blocks.

The libraries will not become digital libraries, but will rather acquire access to ever growing digital collections on behalf of their users. Most of these collections are being made available by external sources like commercial publishers, collections mounted by scholarly societies, resources at other libraries, electronic journal sites, etc. The electronic journals have become the largest and fastest growing segment of digital collections for most libraries. The Internet has long been a favourite media for experimenting with electronic publishing and delivery. The technology allows creation of fully digitised multimedia products and make them accessible through the Internet. Technological changes, especially the Internet and Web technology, continue to attract more and more traditional players to adopt it as a global way to offer their publications to the international community of scientists and technologists. Most of the important publishers now have their web-based interfaces to offer full-text of their journals. The current electronic publishing market consists of traditional players offering electronic versions of their print journals as well as several new enterprises offering new products and services that are "borne digital". The market also has several subscription agents in their new role as electronic aggregators.

Besides electronic journals, there are several online databases that are now available through the Web including Medline (several versions), AGRICOLA and ERIC. Most online search services like STN and DIALOG also have their Web-based interfaces. Reference works like encyclopedia, dictionaries, handbooks, atlases, etc. are also making their electronic appearance on the Web. However, amongst electronic resources created exclusively for the Web, imbibing all features and facilities offered by the new technology, include Web-based educational tutorials called "online courseware". The online courseware is proliferating the Web as a strong contender for distant education. Telecampus, Canada (www.telecampus.edu) lists more than 12,000 online courseware available on the Web. Moreover, highly specialised Websites are now coming up in various disciplines which offer information! in totality including all kinds of resources in electronic format. EI Engineering Village (http://www.ei.org/),

ISI Electronic Library (http://www.isinet.com), IEEE/ IEE Electronic Library (http://www.ieee. org/), Engineering Sciences Data Unit (http://www.esdu.com) are some of the important examples.

Electronic resources accessible on the Web for free or for a fee are undeniably major and important constituent of a digital library. Librarians and information professionals should be well-versed with these resources, options and method for making them accessible to their users.

13. Information Technology-based Library Services

The electronic resources and associated technologies are only a means to generate services keeping its potential users in mind. Like printed resources are used in traditional libraries to generate services by the library staff, the digital resources are used to generate services using software driven Web-based interfaces. Computer programs substitute for the intellectually demanding tasks that are traditionally carried out by skilled professionals. Activities that require considerable mental activities, like reference service cataloguing and indexing, seeking information, etc. are performed by computer programs through Web-based interface.

New information technology can potentially support a range of traditional and non-traditional library services. Most of the library services generated using digital resources resemble closely to those generated manually with improvements and modifications to suit the requirements of automated services. However, digital resources have also been used to generate innovative services that did not have a counterpart in manual parlances.

These services are:

13.1 Traditional Library Services Modified Using New Information Technology

13.1.1 OPAC to web PAC

Remote access to the library catalogues was possible only through a telnet connection till recently. The Web-based interfaces are now available for most of the integrated library software packages including Libsys. Websites are increasingly providing links to their web PAC instead of telnet links to their Library OPAC. Exploiting the provisions of hyper linking that the web provides, various searchable elements of a bibliographic record in a Web PAC are hyperlinks to other records in the database. For example, an author is a hyperlink to all records in the database for, that author, a series is a hyperlink to all serial titles under that series; a keyword for a record is a link to all records in database having that keyword, etc. In effect, a Web PAC adds software-based functionality to a conventional OPAC. A user has additional incentives

to visit the library web page hosting web PAC. With Web-based resources and services in place, many libraries are phasing out their dumb terminals. The library Websites are increasingly becoming a more logical gateway to the catalogue and other Web-based library resources. The acceptability of Web-based interfaces to the Library OPAC is much greater because Web interfaces are familiar to the users with its graphical and navigational interfaces. The users can click complex subjects instead of typing them or remembering complex unix commands.

13.1.2 CD-ROM to Web-based Indexes and Databases

Availability of CD-ROM in the late 1980s, as a media with high storage capacity, longitivity, and ease of transportation triggered production of several CD-ROM information products which were earlier available through online vendors or as conventional abstracting and indexing services in printed format. Some of the important secondary services including "Guide to Current Periodical Literature" (H. W. Wilson) discontinued their print version in favour of CD-ROM version which had improved functionality in terms of search and browsing interfaces. The libraries are witnessing yet another migration from bibliographic databases on CD-ROM to Web-based bibliographic databases akin to the one that was witnessed earlier from print based secondary services to CD-ROM databases. This phenomenon has further been fuelled with the availability of Web-interfaces for most of the online search services. The Web-based interfaces provide several advantages to users that are either not possible or not yet available on CD-ROM. Most Web-based bibliographic databases use hyperlinks and other facilities possible in a web documents including link to the full-text of articles to a publisher's Website. Several bibliographic databases have discontinued their CD-ROM version in favour of web-based version. Besides advantages mentioned above, migration to Web-based services open up resources to remote users.

13.1.3 Manual Reference Service to Digital Reference Service

Reference service and imparting instructural training to the library users are key areas of activities for any library. The technology now allows reference librarians to reach out to the users using the network instead of waiting at the reference desk for users to come by. Besides, imparting instructions on mechanisms of using a library, a reference librarian is also involved in delivering reference service that require deep intellectual understanding of subject. Although automated libraries are not yet sufficiently advanced to offer interactive reference services, electronically- mediated reference services are increasingly available through libraries and information centres.

Digital reference service, also called "Ask-An-Expert" or "Ask-A-Li-

brarian" services are Internet-based question and answer service that connect users with individuals who possess specialised subject knowledge and skill in conducting precision searches (Davis, 2000). As opposed to static Web pages, digital reference services use the Internet to place people in contact with people who can answer specific question and instruct users on developing certain skills. The people who serve as digital reference experts (also called volunteers or mentors) are most of the time information specialists, affiliated to various libraries.

How does it Work?

Most "Ask-a-Librarian" services have a web-based question submission form or an e-mail address or both. Users may submit questions by using either of the forms. Once a question is read by a service, it is assigned to an individual expert for answering. An expert responds to the question with factual information and or a list of information resources. The response is either sent to the user's E-mail account or is posted on the web so that the user can access it after a certain period of time. Many services have informative web sites that include archives of questions and answers and a set of FAQs. Users are usually suggested to browse archives and FAQs before submitting a question in case sufficient information already exists.

Virtual Reference Desk (http://www.vrd.org/) provides resources and links to experts that offer digital reference services. The site hosts searchable database of high quality "ASK-A" service along with alphabetical and subject wise listing. Virtual Reference Desk also hosts a listserv called "Dig-Ref" to promote and explore the growing areas of digital reference services.

13.1.4 Manual Reference Service to Real time Digital Reference Service: Library Chat Rooms

Several libraries have started experimenting with offering real time digital reference service, using chat software, live interactive communication activities, call counter management software. Web contact software, bulletin board services, interactive customer assistance system or related technologies.

Many libraries are experimenting with Internet chat technology as an innovative method to extend and enhance traditional and remote reference service. While digital reference service is asynchronous method of information delivery, the Internet chat providing the benefit of synchronous communication between a user and a reference librarian (or mentor). Interactive reference services facilitate a user to talk to a real, live reference librarian at any time of day or night from any where in the world. Unlike with email reference, the librarian can perform a reference interview of a sort by seeking clarifications from the user. The librarian can conduct Internet searches and push

websites onto the patron's browser, and can receive immediate feedback from the patron as to whether his or her question has been answered to his satisfaction. Most libraries currently involved in real-time reference service are part of a collaborative network so that they can share staffing and work around the clock to' truly provide reference service any time. Library of Congress Collaborative Digital Reference Service (http://www.loc.gov/rr/digref/cdrshome.html) is one of such services. Several institutions including Cornell University, Internet Public Library, Michigan State University and North Carolina University are offering Internet chat-based services using software like Live Person, AOL Instant Messenger, Conference Room and Netscape Chat. The librarians have observed that their relatively new chat-based service logged significantly more questions in a relatively short time than their well-established E-mail digital reference service.

LiveRef(sm) (http://www.public.iastate.edu/~CYBERSTACKS/LiveRef.htm) maintains an online registry of real-time digital reference services.

13.1.5 Manual Document Delivery to Electronic Delivery Services

Abstracting and indexing services have proved themselves as most effective means of finding recent and retrospective published research work. The effectiveness of these secondary services are further enhanced with A the availability of these secondary services on CD-ROM with efficient search interfaces and other features that are possible only in electronic media.

Once a researcher gets bibliographic references relevant to his research work, the more arduous task of locating the full-text of research article begins. While the parent library may cater only to 10-20 per cent of his references, remaining articles may have tape arranged through Inter Library Loan (ILL) or through Document Delivery Services (DDS) which can be very time consuming. Most Libraries use commercial (Informatics India) and non-commercial (BLLD and INSDOC) document delivery services to ensure quick and efficient access to primary information for the library users. Most online search services like DIALOG, ESA /IRS and STN have been offering manual document supply services since their inception. The process is labour-intensive and time consuming.

The term "electronic document delivery systems" implies delivery of electronic version of a document that might involve reproduction of an electronic copy of a document if it is not available in electronic format. The libraries had been using fax machines for immediate delivery of photocopies of articles via telephone lines. The first use of electronic document delivery was based on scanning technology. With maturity of scanning equipment and technology, document supply services started scanning the documents as bitmap page images. Applications are built in such a way so as to automatically

produce a hard copy together with a header page containing the address of the applicant which can again be send by snail mail or facsimile. A software package known as "Ariel" is used in several libraries in developed countries for delivery of scanned articles via Internet. The Ariel software is loaded on an Internet-enabled computer, can receive and send electronic information to other libraries which have installed Ariel. The ADONIS system developed in the late 1980s is a document delivery system based on bit-mapped page images.

Availability of most of the peer reviewed research journals in electronic format, inexpensive technology to scan articles and improved electronic delivery mechanisms are some of the enabling factors that has contributed to well-established electronic document delivery system now available commercially. More recently most of the secondary services that were available on CD-ROM or through online search services are now available on the Internet where the bibliographic references are linked to their full-text on the publisher's site. The technology has now been perfected and there are several electronic document delivery services that allow a user to download an article in full-text from their site or deliver them electronically as attachment to e-mails. Most electronic publishers and aggregators liken OCLC, Blackwell, OVID, etc. are offering full-text of articles through their web sites. Different vendors have various payment options; some charge each time the journal is used, whereas others provide open access for a set annual fee. A user who wishes to have the item delivered can enter a credit card number and specify a delivery method (postal, UPS, fax. E-mail, etc.) and indicate whether it is a rush item (with a rush order fee attached.)

The ADONIS (Article Delivery Over Network information Systems) can be considered as a landmark development in electronic document delivery system. The project was launched by a consortium of five major publishers- Academic Press, Blackwell's Scientific Publications, Elsevier Science Publications, Pergamon Press and Springer Verlag. The project uses combination of laser scanning, printing and digital optical storage technology for storage and retrieval of complete pages of over 650 scientific, technical and medical journal articles. The issues of journals are available on CD-ROM with weekly updates for distribution to each centre in various countries licensed to use the system for document delivery.

14.2 New Web-based Library Services
14.2.1 Virtual Library Tours
Several library Websites facilitate virtual guide to the physical facilities including collections, services and infrastructure available in the library through their web

sites. The combination of the following three Web-based interfaces are used to facilitate the virtual library tours:

14.2.2 Library Maps and Floor Plans

Most library Websites provide library layouts and floor plans to guide users to physical location of facilities and services along with link to relevant information. Client-side image maps are used to make various parts of floor plans as clickable image maps. An example can be seen at the Central Library Home Page of the Central Library, 1IT Delhi at: http://www.iitd.ac.in/acad/library/layout.html.

14.2.3 Photographic Views

A view of 360° photographic environment Using plug-ins like Quick Time and iPix are available at a few library sites. Examples can be seen at Botsford General Hospital Library site. (http://www.botsfordlibrary.org/ tour.html).

14.2.4 Library Websites

Academic libraries in developed countries started using Web technology to create home pages as starting points or as gateways for searching information about the library. A home page reflects characteristics of an academic institution. It provides an opportunity to the library to propagate its services and facilities to the academic community worldwide. The home pages of libraries are increasingly used as an integrated interface designed to deliver detailed information about a library as well as to provide access to all computer-based services offered by a library.

Besides offering information, the library web sites of academic institutions invariably hosts subject gateways or subject portals that contains links to web resources for subjects of interest to the institution. Most of the services (modified or new) included in this article are offered through the web sites of most of the academic institutions especially in developed world. The IIT Delhi Central Library also offers several of these services through its web site available at http://www.iitd.ac.in/acad/library/. The Sun-site Digital library at University of California at Berkley (http:// sunsite.berkley.edu/libweb/index/html) lists more than 4,000 libraries having web sites.

14.2.5 Subject Gateways or Library Portals

The Web, being a hypermedia-based system, allows linking amongst electronic resources stored on servers dispersed geographically on distant locations. The portal sites or gateways redirect a user to the holders of the original digital material. The librarians, being the earliest users of the Web, started to gather and organise link to important Web-based resources on various subjects.

A subject gateway can be defined as facility that allow easier access to Web-based resources in a defined subject area. The simplest types of subject gateways are sets of web pages containing list of links to resources. Some gateways index their lists of links and provide a simple search facility. More advanced gateways offer a much-enhanced service via a system consisting of a resource database and various indexes, which can be searched and/or browsed throughout a Web-based interface (O'Leary, M., 2000).

Subject gateways are also known as Subject-based Information Gateways (SBIGs), subject-based gateways, subject index gateways, virtual libraries, clearing houses, subject trees, pathfinders, etc. Subject gateway is an important component of a library Website designed for the library users so as to help them discover high-quality information on the Internet in a quick and effective way.

In the traditional information environment human intermediaries, such as publishers and librarians, filter and process information so that users can search catalogues and indexes of organised knowledge as opposed to raw data and information. Subject gateways work on the same principle, i.e. they employ subject experts and information professionals to select, classify and catalogue Internet resources to aid .search and retrieval for the users. Users are offered access to a database of Internet resources descriptions which they can search by keywords or browse by subject area. A description of each resource is provided to help users assess very quickly its origin, content and nature, enabling them to decide if it is worth investigating further. In the process users are benefited from the expertise of librarians and subject experts with subject gateways rather than having to locate, evaluate, filter and organise the resources themselves. Specialised software are available as freeware or as priced software to create and maintain professionally developed subject gateways. Some of the major portal sites or gateways that provide access to electronic resources on the Internet are as follows:

WWW Virtual Library
Internet Public Library
Michigan Electronic Library
Penn Electronic Library
    sources/
BUBL Information Service
Argus Clearing House
Internet Index
    nternetlndex/

http://www.edoc.com/
http://www.ipl.org/
http://mel.lib.mi.us/
http://www.library.upenn.edu/re

http://bubl.ac.uk/
http://www.clearinghouse.net/
http://sunsite.berkeley.edu/

14.2.6 Web-based User Education

The www provides a dynamic environment for distributing information over a large network and Web-based instructions is a suitable tool to do so. Web-based guides and teaching tools can be easily updated, accessed, and printed on demand. They may include colour graphics and screenshots. The Web-based user education provides a high degree of interactivity and flexibility to the users offering them the benefit of self-pace, graduated to teach from basic to highly advanced levels and designed in a wide range of formats that accommodate diverse learning styles. The proliferation of digital resources will generate greater demands on reference and instructional services. With availability of digital resources that can be used anywhere at any time, requirement for instructional and reference services would also grow. Failure to develop both the technological aspects and required service components would lead to under utilisation of digital resources. The library Websites can use Web-based user education for imparting training to users in the following areas:

i)   Basic library skills along with glossary of library terms;
ii)   Using Library OPAC/ Web PAC, locating books, magazines and other library materials;
iii)   Instructions for searching CD-ROM and Web-based databases and other electronic resources; and
iv)   Instructions on subject searching training, using Boolean operators and searching Internet resources through search engines.

The web technology provides for incorporating both synchronous and asynchronous interactivity in the Web-based user education.

14.2.7 Frequently Asked Questions (FAQ)

Most library Websites have Frequently Asked Questions (FAQ) along with their answers. Some libraries have database-driven FAQs along with search interface. These FAQs are generally on the services and facilities that the library provides. These FAQs generally do not include reference questions.

14.2.8 Library Calendar

The library calendar lists events or show information for forthcoming events. Library calendars have improved look and functionality with JavaScript or special software.

14.2.9 Web Forms

Most library Websites have Web forms for inviting feedback from the users such as:

i) Suggestions for services;

ii) Users Survey;

iii) Comments on the Website and suggestions to improve it;

iv) Requests for library to acquire certain titles or materials;

v) Reference Service (often Ask-a-Librarian); and

vi) Interlibrary loan or other document delivering services

14.2.10 Bulletin Boards, Threaded Discussion Forum and Listservs

Several libraries are using bulletin boards, threaded discussion forum and listservs to help promote and evolve Web-based library services. Most libraries use bulletin board system as an electronic message system to propagate or announce the services and new activities. The bulletin board system is also used as an interactive interface to invite suggestions on activities and services of a given library. It can also be used as an interface to distribute library services. .Messages in a bulletin board system can be written by anyone and are stored in a common area for any one to read.

Discussion, forums allow open exchange of messages on a topic of common interest. Discussion forums allow users to initiate a discussion on new topics, replying to an ongoing discussions (called thread). All messages for a given topic or thread are grouped together for the convenience of users. Discussion forums are basically modified bulletin boards, which have on added feature of dividing messages into logical groupings called thread. Threads enable a person to focus on a particular topic and see inputs from many individuals making comments on the topic.

A listserv is a mailing list program wherein a group of people with common interests are connected by E-mail. Any mail sent to the listserv is distributed to all those who have signed up for the list. Several libraries host listservs for the users for providing them a platform to discuss and share their views on books that they have read, or discuss specific books / authors.

15. Skill Development in IT for Librarians

The Library and information centers are going through a process of transformation with increase in the use of new information technology its products and services in libraries. The librarians and information workers find difficulties in copying with fast technological developments due to lack of sufficient continuing education for them. A great deal of strategic planning is required to address this issue.

While it is important to revise library science curriculum with introduction of strong components of IT for fresh library science graduates, it is equally important to train existing manpower in the libraries through continuing educational programmes. Continuing education may include educational ac-

tivities primarily designed to keep practicing librarians and information professionals abreast of their particular domain in library, and to provide them with training in new fields of IT. Continuing education activities in our country, is generally offered on irregular basis through training programmes organised by institutions, individuals, association and departments of library and information science of universities.

The article has briefly described major new information technologies, its products and services and; associated skills that are required for the development of services in the libraries. Specific IT skills relevant for courses and programmes that can be offered as continuing education may include:

i. Library Automation
ii. Online Information Retrieval
iii. CD ROM / DVD as media and it's networking
iv. Office Automation and Electronic-based Communication Systems
v. Electronic document delivery
vi. Electronic reference service and real-time reference services
vii. Database Management Systems
viii. Web Site Designing
ix. Internet, Intranet and Extranet
x. Multimedia applications in libraries
xi. Internet: Resources and Services

16. Conclusion

Rapid growth of information technology, particularly the Internet and associated technologies, has opened up an entirely new medium for providing improved information services and resources for the users. As information professionals, we have the opportunity not only to play a leading role in the organisation and navigation using new tools and technologies, but also in the development and maintenance of IT-based services and resources for our users and organisations. With availability of Web-based resources and services, the local collection of a library is not the only source of information for a user. The users are interacting virtually with the library collections and resources as well as with host of resources that the librarian did not select or may not even know about them. The librarians can no longer stay behind the desk to wait for the users to come, assuming that the users would approach them at the right time and for the right things. The role of the library as a primary aggregator of content for its users is less and less unique. In an environment of self-service databases, electronic forms, web information and the growth of distance education, a user is likely to approach the librarian after he has

already begun his search, but was not satisfied with the results.

The future will require the librarians to reorient themselves, think creatively and adopt new technology to generate services and resources where their skills of structuring and organising resources are put to its best use. With myriad of disorganised and unverified information, the Web is in need of librarians who are trained in the structuring and organising information, have the ability, to locate and evaluate information resources, and have in-depth subject expertise. If the librarians are committed to sustain their roles as providers and facilitator of information in the emerging and competitive space of higher education, they would need to adopt new technology, interact with users to learn about their requirements and expectations. The librarians have to join the academic community as facilitators and collaborators, guide the students through the complex maze of print and digital resources, teaching them how to search effectively and helping them judge the quality and usefulness of the information that they encounter. The opportunities are limitless especially in the chaotic scenario of Internet.

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Book News

The Penguine Indian Reference Yearbook 2005
Compiled and edited by *Derek O' Brien*
Penguine Indian (2004), Pp. 976 (with 32 colour pages), Price Rs. 120

This handy volume contains facts, figures and interesting information of every conceivable kind about what's happening in India and the World. The blurb claims that the informations contained in the volume are culled together from official government releases and other reliable sources, and hence authentic.

Detailed India and The World Sections, running to over 400 pages, provide thorough historical, geographical, demographic and economic profiles of every country in the world and every state and union territory in India. A comprehensive year in review section has a day-by-day listing of important happenings of the year. In addition, Indian and International Historical Timelines list important incidents from the 'beginnings of time' to the present. Separate sections of Politics, Economics, Science, Career, Sports, Arts and General Knowledge make for easy reference.

A key feature of the volume is a host of brief and insightful articles on various topics of current interest by celebrated writers like A.P.J. Abdul Kalam, Shashi Tharoor, Khushwant Singh, Bipan Chandra, N.R. Narayana Murthy, J.V. Narlikar, Pavan K. Varma and others.

The book is full of features that aim to provide useful data in an easily accessible format.

Two Alone, Two Together
Letters between Indira Gandhi and Jawaharlal Nehru (1922-64)
Edited by *Sonia Gandhi*
Penguine India (2004), Pp. 648, Price Rs.595

The letters in this volume, selected from the extensive correspondence between Jawaharlal Nehru and his daughter Indira Gandhi spanning over more than forty years, are like 'conversation in paper—but more revealing', as Sonia Gandhi observes. Intimate, articulate and unreserved, they provide illuminating new insights into the character and personality of two of the most towering figures of modern India.

Remarkable for their honesty, sensitivity and humour, and replete

with vivid descriptions of major personalities and events of their times, the letters chart Indira Gandhi's development from a shy, frail school-girl into a charismatic political leader; they reflect the love of nature and books that father and daughter shared, and reveal their candid views on a variety of subjects, ranging from family and friends to issues of political and national importance. Above all, this volume reflects the depth and tenderness of the relationship between the father and the daughter, and the formidable moral and physical courage that was the hallmark of both the personalities.

Understanding the Dalai Lama
Edited by *Rajiv Mehrotra*
Penguin India (2004), Pp 296, Price Rs.395

Ocean of Wisdom, His Holiness, the fourteenth Dalai Lama of Tibet is revered as a bodhisattva—a reincarnation of the Buddha—by six million followers around the world. He describes himself as a simple smiling monk. He is also universally recognized as the best hope for peace and amity in today's trouble world.

In this volume, Rajiv Mehrotra, personal student of His Holiness, brings together a range of contributors who offer insights into different facets of this remarkable individual. Pico Iyer draws a portrait of a disarming man with an infectious laugh, Robert Thurman offers a glimpse of the Dalai Lama's spiritual

development, and Matthieu Ricard describes a day in the life of His Holiness. The Dalai Lama's deep curiosity, keen insight and high level of scientific sophistication is revealed by Daniel Goleman. The book also includes an extended interview with His Holiness by Rajiv Mehrotra.

Twenty-two Yards of Freedom
A Social History of Indian Cricket
Boria Majumdar
Penguine India (2004), Pp 496, Price Rs.595

Published to coincide with the Platinum Jubilee of the BCCI, this book assesses the role of cricket in Indian national life. Majumdar argues that cricket was a means to cross class barriers and had a healthy following even outside the aristocracy and upper middle classes well over a century ago. He also examines the inter relationship between those who patronized and promoted the game and those who played and watched it. The book highlights indigenous cricket traditions in Bengal and the South in addition to those in Mumbai, usually considered the game's home in India, and comments on the early commercialization of the sport in the decades before Independence.

A Raj Collection
Edited by *Saros Cowasjee*
Oxford University Press (2005), Pp.1031, Price Rs.595

The most enduring legacy of the

British Raj in India has been the literature it occasioned. While Kipling, Forster, and Orwell may have become household names over the years, there are other lesser known writers whose contribution is equally important. It is these writers, with their body of work, who make Raj fiction into a genre of its own. The four novels in this volume, together, span the entire period of Raj literature, offering a vivid portrait of colonial India from the time of Kipling to Indian Independence. They trace the changing relationship between the rulers and the ruled from the hey-day of the Empire to its demise in 1947, and add to our understanding of the British and their predicament in India.

Flora Annie Steel's (1847-1929) *On the Face of the Waters* is based on the Sepoy Mutiny of 1857, Edmund Chandler's (1874-1926) *Siri Ram— Revolutionist*, as the title suggests, deals with an Indian revolutionary, rather unsympathetically. Chritine Weston's (1904-89) *Indigo* offers the most dignified portrait of a nationalist in the making while Philip Mason's (1906-99) *The Wild Sweet Witch* presents a nationalist, who is, despite his failings, brave and honest. All these novels have been out of print for several years and the decision to revive them seems to have emanated from the growing importance of Anglo-Indian writing in critical post-colonial discourses.

Nineteenth Century Indian English Prose : A Selection
Edited by *Mohan Ramanan*
Sahitya Akademi (2004), Pp. 248, Price Rs. 130

This selection is an attempt to represent the facility with which Indians used the English language in the nineteenth century. It also represents the various ways in which Indians wrote or spoke of their country and as such it is a selection of statements about India and the idea of the Indian nation. It includes political, cultural, religious and literary pieces and everywhere the preference has been for pieces which show Indian eloquence in English. The figures included are Raja Rammohun Roy, Dadabhai Naoroji, Keshab Chandra Sen, M.G. Ranade, W.C. Bonnerjee, Badruddin Tyabji, Sir Ferozsha Mehta, Romesh Chunder Dutt, Bal Gangadhar Tilak, Swami Vivekananda, Gopal Krishna Gokhale, V.S. Srinivasa Sastri, M.K. Gandhi and Sri Aurobindo. There is a general introduction outlining the relevant contexts of the period and each author selected is also introduced briefly. The collection is reader-friendly but the reader will have to engage actively with the authors and make the necessary connections of themes and ideas to benefit fully from the anthology.

Jacob & Dulce

Sketches form Indo-Portuguese life

Francis Joao Costa (Gip)

Tr. Alvaro Noronha da Costa

Sahitya Akademi (2004), Pp 196, Rs. 115

The characters of Jacob and Dulce and their families were introduced to the public of Goa through the pages of the newspaper *O Ultramar* in a series of sketches published in the 1890s under the title *Notas a Lapis* (Marginal Notes), the author employing the nom de guerre of Gip. The sketches were compiled into a book and first published in 1896 as *Jacob & Dulce*. Gip used the scenes in the plot to criticise Goan Christian society as well as the government of the day; no one was spared his caustic observations. Gip used a few place names that coincided with some in Margao, and it was assumed that the town of Breda in the book is Margao itself and that the characters described belonged to well-known families of that town. A second edition came out in 1907 and there were no reprints until the third editions in 1974 which may have been due to the coyness in exposing the past and the existing warts of Goan society as well as the erroneous perception that the work was a direct attack on known Goan families.

Writing the West

Representations from Indian Languages

Edited by **C. Vijaysree**

Sahitya Akademi (2004), Pp. 244, Price Rs. 125

This volume explores how the 'West' has been written into Indian literary texts and other cultural productions. The twelve essays included here, written by literary critics, cultural historians and film theorists, examine patterns in India's perception and creative representation of the west, each focusing on a specific linguistic context: Assamese, Bengali, Hindi, Oriya, Telugu and Urdu besides Indian writing in English. Though dealing with different regions and languages, most of these papers demonstrate the limits of contemporary post-colonial theorization and urge the need for a reconceptualization of the theories of colonial encounter in order to account for the ways in which India imagined and imaged the west and its civilization.

The Partings

By *Birinchi Kumar Barua (Rasna Barua)*

Tr. Mrinal Miri

Sahitya Akademi (2004), Pp. 263, Price Rs. 125

The original Assamese novel, *Xeuji Pator Kahini,* written by the pioneering author of Assam, Birinchi Kumar Barua aka Rasna Barua, was first published in 1954. Set in pre-Independence Assam, the story juxta-

poses the morally oppressive life in a typical Asamese village and the life of tea garden workers, which, even if marvellously free from the moral pretensions of a small village community, is hash and unrelenting. Nareswar, the outsider from the village, finds "meaning" in the free fun-loving ways of the coolie: and the mercurial Sonia, the illegitimate daughter of a white manager and a young coolie girl, is the unfailing critical eye which sees through all human deceptions. This is the story of love between Nareswar and Sonia woven into the extraordinarily rich texture of life in a tea garden.

At Home in Diaspora
South Asian Scholars and the West
Edited by *Jackie Assayag and Veronique Benei*
Premanent Black (2003), Pp. 207, Price Rs. 495

This collection of essays raises a set of familiar yet compelling questions about the practice of transnational post-colonial scholarship. Featuring 13 first person essays written by Social Science and Humanities scholars and writers of South Asian origin (in all cases, Indian) who were asked "to write a short reflexive account of their personal and academic experience in relation to the 'West', together with their reflections on transformation of knowledge about Asia". The contributors include such reputed names like Shahid Amin, Urvashi Butatlia, Dipesh Chakrabarty,

Partha Chatterjee, Ramchandra Guha, Sudipta Kaviraj et al.

At its best the volume addressed the following question: In what ways is knowledge about South Asia situated and has this transnationally produced knowledge led to new critical paradigms? Additionally, the volume opens a productive debate on the very method of tracing the transformation of a field.

Saheb Bibi Golam
Bimal Mitra
Tr. Subash Chandra Saskar, Suchitra Sarkar
National Book Trust (2004), Pp 617, Price Rs. 170

A Finely evoked English translation of one of the most popular works of modern Bengali literature, the novel tells the story of the house of Chowdhury's, its gradual decline along with the disintegration of a feudal system. In narrating the saga, the book captures a Bengal caught in the midst of sweeping social, material and cultural transformation.

The Market that Failed
Neo-Liberal Economic Reforms in India
C.P. Chandrasekhar and Jayati Ghosh
LeftWord (2004) Pp 191, Price Rs. 125

The explicit adoption of a neo-liberal reform programme in mid-1991 by the Indian government was the start of a period of intensive economic

liberalization and changed attitudes towards government intervention in the economy. This book surveys the actual experience of the period since then to argue that this strategy has not just failed to deliver sustained growth, but has had damaging consequences from the point of view of employment, poverty alleviation and equity. It covers a wide range of areas, including fiscal and monetary policy, privatization and the experience with foreign direct investment, and analyses the political economy of the reform process.

Remaking India
One Country, One Destiny
Arun Mitra
Sage Publications (2004), Pg 236, Price Rs. 295

This book is an impassioned critique of India's current economic and social situation and argues for a better way to create inclusive development and growth. Arun Mitra examines a broad canvas of concerns, and emphasizes that unless India's growth percolates to its poor and underprivileged we will have a divided and unequal society and nation.

Early Women's Writings in Orissa, 1898-1950
A Lost Tradition
Edited by **Sachidananda Mohanty**
Sage Publications (2005), Pp 244, Price Rs. 550

Based on archival research, this fascinating book brings together many of the neglected writing of Oriya women of the late nineteenth and early twentieth centuries. Utilizing different forms—short stories, poems, essays, travel writing, novels and letters—these women writers responded honestly both to the world that was in turmoil around them and to the demands of their own inner selves.

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"Today's libraries are much more than books alone. They are also art reproductions, music recordings , language aids, motion pictures , microfilms , meeting rooms for discussion groups.... . They are beehive of activities, busy humming market places of ideas where the fields of interest are not narrowed to the educational or the cultural, but limitless as the span of man's own consciousness: a veritable treasure chest of facts and follies ... a kind of intellectual service station".

Alex Dreier

Cover Design - Sandip Sinha