LIBRARY PRACTICES *for* EFFECTIVE MANAGEMENT

ILA Seminar Papers
47th All India Library Conference
Warangal, 20-23 Dec. 2001

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INDIAN LIBRARY ASSOCIATION 2001

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Contents

Forword		xiii
Preface		xv
Library Services		
1	The Role of Rural Community Information Services for Empowering Rural Women in Deveploping Countries like India P. KAMAIAH	1
2	Library and Information Services in Changing Envoirnment SMRITI REKHA BARUAH	10
3	Library and Information Sources and Services in Agricultural University Libraries in Karnataka: A Study B.V. KANNAPPANAVAR	17
4	Library and Inforamtion Services in Central Library, Acharya N.G. Ranga Agricultural University, Hyderabad K. VEERANJANEYULU	29
5	Agriculture Research Information System: Strageties for Quality Agricultural Information Services SURENDRA KUMAR AND S. KUMAR	28
6	Information Services in Osmania University Library : A Survey P. BHASKARA RAO AND E. PAVAN KUMAR	55
7	Accessing the Web for Reference Services DEVENDRA KUMAR KAUSHIK AND SONIA RELAN	65

8 Newspaper Clipping Services in Digital World 73
RAJEEV VIJ AND MOHINDER SINGH

9 Information Needs and Seeking Behaviour of Physical Education Teachers in India 90
L. USHA DEVI

10 Knowledge Management Technologies to Disseminate Information Wealth 98
V.VENKATA RAMAN, C.PRADEEP AND R.POMMAL RAO

11 Library Services to Distant Learners in India : A Case Study of SDLCE 105
M. ANJAIAH AND K. PRAVEEN KUMAR

12 Library and Information Science and Logistics 111
S.S. JANARDAN RAO AND M. SANKAR REDDY

13 Establishment of a Documentation and Information Centre as an Electronic Library : A Case Study of Rajeev Gandhi National Drinking Water Mission 117
PRAVIN K.CHOUDHARY, PRABHAT K.CHOUDHARY AND K.N.JHA

14 Revitalising the University Library Services in the Rapidly Changing Enviornment 130
JAGTAR SINGH AND TRISHANJIT KAUR

15 What Library can do for the Citizen of the Country 137
ASHISH KUMAR

Information Technology and Library Services

16 Internet for Rural Development: Role of Rural Libraries for Quality Information Services in India 138
P. ANURADHA

17 Cruising the Net for bibliography/Full Text Information 148
V. V. LAKSHMI AND B. R. NAGAR

18 Digitised Information Services for Academic Libraries 171
M.SATYANARAYANA AND L.VENKATESWARA RAO

19 Access to Electronic or Digitised Sources: Metadata as a Tool 178
C. SASIKALA

Library Management

20 Impact of Information Technology (IT) on Library Management 191
ANIL KUMAR DHIMAN

21 Management Information System in Libraries and Information Centres 203
T. JAYA SINGH

22 Role of ILA in Developing Best Library Practices for Quality, Services and Survival of Professionals: A Statistical Analysis 208
LEENA SHAH AND S. KUMAR

23 Degressive Attention Towards Information Services Necessitating Spontaneous Salvate Solution 230
V.VENKATA RAMAN, C.PRADEEP AND R.POMMAL RAO

24 Library Practices: A Study of Organisational Climate of University Libraries in Haryana 238
AJIT SINGH SIWATCH

25 A Study on Working Conditions of College Librarians 252
B.S.SWAROOP RANI, A.VICTOR AND K.SARASWATHI

Quality Management in Libraries

26 Measurement of University Library Services: A Case Study of Karnatak University Library, Dharwad 260
RAMESHA AND B.D. KUMBAR

27 Management of Change for Quality Imporvement in Library and Information Centres: A Case Study of Regional Engineering College Library, Warangal 279
K.RAMANIAH AND A. JAYAPRAKASH

28 Performance Evaluation as a Tool for Quality Services in Government Library—A Case Study 288
KEYA BASU

29 Ensuring Quality of Library and Information science Courses through Distance Education 296
SAVITA MITTAL

30 Measureing best Performance for Quality Human Resource Development: An Analysis of the Papers Contributed in ILA Conferences 304
S.KUMAR AND LEENA SHAH

31 Quality and Action Plans for Implimentation of TQM in University Libraries 331
K.C.DABAS AND SEWA SINGH

32 Application of Total Quality Management to the University Libraries for Quality, Impact and Survival 339
K.C. DABAS AND SEWA SINGH

Marketing of Library and Information Services

33 Strategies for Marketing of Information 341
B.S. BIRADAR

34 Marketing Management: Implications for Implimentation in Libraries and Information Centres 346
PADMAMMA S.

35 Information Marketing: Need of the Hour 358
SHWETA N. PANDYA

36 Marketing of Information Services in the Digital Envoirnment 368
I. CHANDRAIAH

37 Need for Marketing of Information Services and Products in Academic Libraries: With special Reference to Nagpur University Automated Information Services 379
D.RAJYALAKSMI AND SHALINI WAGHMARE

Human Resource Management in Libraries

38 Human Resources Development in Libraries 396
LAWYED STEPHENS AND V.T.R. VIJAY KUMAR

39 Human Resource Development in Indian University Libraries in the new Envoirnment of Information Technology: Case Study of a University Library In Punjab 402
SUKHDEV SINGH AND SARITA RANI

40 A Study of Personnel Managemt in Aided Arts and Science College Libraries in Manaonmaniam Sundaranar University Area 414
M. NAGARAJAN AND S.SURIANARAYANAN

41 Strategy for Motivating Library Personnel in Times of Change: The Saamkhya Yoga Way 421
P.G.TADASAD AND B.S.MAHESWARAPPA

42 Impact of Information Technology on Human Resource Development in Library and Information Centres in Chennai: A Study 433
V.KASI RAO, B.RAMESH BABU AND S.GOPALAKRISHNAN

43 Kaizen—Inexpensive Way to Develop Human Resources in Libraries 442
JUIN DUTTA

44 Human Resource Development and Information Marketing 449
DIGVIJAY SINGH J.CHAUHAN

Library Automation and Network

45 Computerisation of the Aligarh Muslim Universtiy Library 450
AMJAD ALI

46 Wall-Less Libraries—in Relation to Resource Sharing 456
KALYANI ACCANOOR

47 Are We Moving to the Paperless Society 465
K.VENKATESHWARLU AND V.YUGENDER GUPTA

48 Building up of Serials Database in an University Library: A Case Study of Indira Gandhi Memorial Library, University of Hyderabad 475
V. UMA

49 Rental Textbook Service as a Model for Resource Sharing: A Case Study of Pantnagar University Library 490
SUNIL GORIA AND RAMESH KUMAR

50 Hindi Data Base Management 498
B.T. GANGU AND YAKUB ALI

51 Computerisation of Pamphlets Section of Central Library of the Indian Institute of Technology, Bombay (IITB) 510
N.J.BAMANE

52 Biotechnology Information System Network (BIOINFORMATICS): A Case Study of Devi Ahilya Vishwa Vidhyalaya, Indore 517
S.S. CHANDEL AND S.KUMAR

53 The Challenges of Networking: Use of Hybrid System in Indian Libraries 533
YOGESH MODI AND KRISHNAPAL SINGH CHOUHAN

54 The Role of Information Technology in Power Delegation for Effective Management of University Libraries: A Feasibility Study 541
R.RAMCHANDER

55 Networking of 'Information Houses' in India: An Ideal Model 552
T.A.V.MURTHY AND M. KANKACHARY

Need for Networking in Technical Institute Libraries 659a
B.G.SUKNURE

56 Data and Knowledge Networking 757
B.RAVI AND N.VARTHARAJAN

Collection Development in Libraries

57 Best Library Practices for Quality Impact and Survival: A Study of the Periodical Section of Dr. V.S.Krishna Library, Andhra University,Waltair 558
K.SUGATHRI DEVI

Information Technology and Collection Development

58 Collection of Development Practices in IT Era 566
NISHANT FATIMA

59	Internet and its Use in Enriching and Upgrading of Information Resources in Academic Libraries in India: An Operational Strategy to overcome the Problem of Financial Crunch R.K. BHATT AND MANORAMA TRIPATHI	572
60	Digitising Library Collection: Best Practices in the Indian Context V.K. JEEVAN	584
61	Digital Libraries: Apprehensions, Aspirations and Challenges RASHMI YADAV AND R.L. ARORA	608
62	Issues and Challenges in Creating Digital Libraries MUKUT SARMAH AND SUMANA CHATRABARTY	618
63	Towards the Digital Library: Impact on Librarians AMRITPAL KAUR AND RANJIT SINGH RANA	628
64	Collisions and Adhibition of Electronics Publishing in Digital Libraries RABINARAYAN MISHRA	636
65	Criteria for Digitisation of University Libraries in India DESHBANDHU SHARMA, AMRUTH SHERIKAR AND SURESH JANGE	645
66	Digitisation of Manuscripts at Osmania University Libraries P.DAMODHAR, A.S.CHAKRAVARTHY AND R.K.PAVAN KUMAR	653
67	Role of Cryptography in Information Handling ADARSH N.GOKUL AND K.S. AMBILI	660
68	Wither Away Indexing? The Impact of Internet on Subject Indexing and Information Retrival R.S.R. VARALAKSHMI	669
69	Concept of virtual Library S.L.SANGAM AND S.R.KULKARNI	681

Library Education

70 Re-orientation of LIS Education according to Contemporary Needs: Role of INSDOC 696
PREMA PARVATHARAJAN, A.S.RAO AND V.K. GUPTA

71 Library Services and Distant Education in Jammu and Kashmir State 711
RAM RATAN SHARMA

72 Skills Required by LIS Professionals in the new Millenium 722
SANGEETA GUPTA

Library Education and Information Technology

73 Information Communication Technology and Education 727
BASHIR AHMAD

74 Designing Web Based Learning Modules for People with Special Needs: Some Guidlines and Practices 736
TARIQ ASHRAF

Library Management

75 Engineering College Libraries Under the Jurisdiction of Kuvempu University: A Survey 747
B.U.KANNAPPANWAR, CHIDANANDA SWAMY H.M. AND K.MANJUNATH

FOREWORD

It has become a cliché to say that libraries and librarians have to change in the new environment. It is also a well known fact that libraries and librarians are facing challenges from other groups of information processors and disseminators. Librarians have become aware that they can no longer be smug about what they have been doing so far and what they are capable of. Their technical expertise have to be adjudged once again in the new context and their age old practices have to be remodelled to suit new situations.

Traditional practices in libraries are time tested and have been in vogue for many years, However, with IT taking over the field of information processing and dissemination at the global level, library practices and librarian's role in this field will have to work in tandem with the new developments. No longer can libraries work in isolation and librarians remain unaware of the direction of the tide which all of us have to reckon with. Experience of library practices which are based on users' needs have to be utilised to prepare built in retrieval facilities for dissemination purposes. Since library and information services are not personalised and institution based any more, the librarian's mind and expertise to sift through available information and salvage the right information for the right user have to be now created in the new IT based facilities. To actually fructify this, the meticulous detail followed in libraries, and all the tools developed so far for processing of documents and data have to be used to make information really user approachable in the electronic environment.

ILA in its 47th Conference has addressed this major issue and the theme of the conference is 'Best Library Practices for quality, impact and survival. The theme itself is self-explanatory. Without opting for new practices in libraries and information centers, libraries can not expect acceptance from users at this juncture. It is the quality of repackaged information which will actually ensure the survival of libraries and librarians. The response to our call to papers have been very good, considering the fact that the topic does not allow theoretical writings. Only hands on experience and its results are going to be of significance. ILA has received 76 papers from members residing in different parts of the country. It is very heartening to find that many papers have been written by

young librarians working in different types of institutions. ILA needs to have the support and services of young and dynamic librarians with modern outlook, to help librarianship gain the status it deserves.

The papers encompass a very broad spectrum of library practices, from routine activities, such as collection development to marketing of information which is a new concept. The authors have all tried to fit the library practices in the IT environment which has to be focussed at present.

The volume has been edited by a group of senior library professionals from different institutions and backgrounds. As the Editor, I am very thankful to all of them. I do hope that the deliberations during the conference will enable ILA to prepare suitable standards for Best Practices in libraries and information centers which can act as the basis for developing new user oriented library and information services.

I thankfully acknowledge the help and assistance extended by all my colleagues and team mates in the ILA to ensure the high quality of the volume.

Ms. Kalpana Dasgupta
President, ILA

Date 15.12.2001

PREFACE

Librarians and libraries have always geared themselves up to meet new challenges which confront them with changing situations. Library practices for extending useful services to its clientele have undergone necessary changes over time to suit the requirement of time and space. Presently this profession is facing multi pronged challenges from within as well as from external forces.

The global phenomena of Information deluge and use of Information Technology to deal with the same, have made librarians rethink their roles and take a fresh look at the utility of library practices that have sufficed so far but are not likely to be worthwhile in the future.

Library practices, though time tested and standardised over the years, need change. Information Technology (IT) has brought about changes not only in information generation but also in the methods of information processing and dissemination. The monopoly of library practices as the main credible information processor and disseminator is being challenged by groups of IT based information processors and disseminators whose work may not be as meticulous but is surely faster and uptodate. Therefore it is time that librarians re-model the well defined practices to make them speedy, accurate and user oriented. Information processing cannot be only technique oriented but should be user friendly and service worthy.

Considering this new challenge facing the profession as a whole, the Indian Library Association decided to organise its 47th All India Library Conference on the theme 'Best Library Practices for Quality, Impact and Survival. The conference is being held at the Kakatiya University in Warangal from 20th to 23rd December 2001.

The Conference will address all those topics pertaining to library practices which will have to survive the IT onslaught and get remodelled to suit the new envoirnment. It will also ascertain

how best librarians can utilise their expertise to come up with better solutions for user oriented information processing and disseminating methods with the help of IT.

The Conference will attempt to undertake the following:

1. Identify those library practices which can be re-modelled in the IT environment to ensure best user oriented services.
2. Identify strategies to remodel the existing library practices to suit the new environment.
3. Prepare useful activity oriented curricula for continuing education and training of library professionals.
4. Prepare standards for best library practices in the IT based environment of India.

There are 76 papers in the volume inclusive of abstracts for 4 papers which could not be included. The papers have been grouped under the following sections:

1. Library Services
2. Information Technology and Library services
3. Library Management
4. Quality Management in Libraries
5. Marketing of Library and Information services
6. Human Resources Management in Libraries
7. Library Automation and Networking
8. Collection Development in Libraries
9. Information Technology and Collection Development
10. Library Education
11. Library Education and Information Technology

The papers cover a very broad spectrum from Collection Development to Marketing of Information. They deal with activities relating to traditional libraries as well as digital libraries. The main thrust however is the changing scenario in the IT based situation. The theme being Best Library Practices, the papers are action specific and many of them are based on library surveys. Some of

the authors have successfully imposed foreign experiences and internationally accepted practices in the Indian context. Since most libraries are still in the initial stages of automation, such forward looking ideas will be very helpful for all types of libraries specially those in the academic sector, government sector, public library sector and in the field of distance education. Many authors have written how traditional sources of information and traditional services can be complemented by utilising IT based sources and services to ensure more comprehensive and useful library services in the future.

Marketing of Information which is a new concept in the field of librarianship seems to have found favour among librarians. There are a number of papers which have spelt out the need for marketing of library services in the present context. Acceptance of the marketing concept by librarians is a heartening development. Librarians have also realised that a practical approach towards networking and resource sharing is required and there are action oriented papers on this topic. Human Resources Development and library education have also been dealt with in many papers. This is a major area ofconcern in the present situation.

However, I have to point out that many authors still have only theorised about concepts and have not given any practical views on actual library practices. It is true that theoretical base is required for formulating any action plan but only theoretical concepts were not expected on this theme.

The volume has been divided on the basis of the broad sections mentioned above. Dr. S.M. Dhawan, Senior Scientist of NPL has been very helpful while editing the volume, specially in preparing the sections and arrangement of papers on broad thematic lines. All the Associate Editors have done their best. I have gained substantially from experienced editors like Prof. B.K. Sen and Prof. S.B. Ghosh. Inspite of their busy working schedules, Dr. P.R. Goswami, Dr. Krishan Gopal, Dr. Rajiv Vij, Shri N. Somasekhara Karnavar and Shri N.K. Bar volunteered to assist in editing the papers. I am thankful to all of them. Special mention has to be made of the support extended by Shri Sunil Dutt of IIPA

in the final stages of editing and proof reading to prepare the actual layout of the volume. The printer and his colleagues deserve our special thanks for undertaking and completing the work on time. Inspite of our best efforts there may be errors in the volume for which we accept the responsibility.

We do hope that this volume will prove to be a good reference tool and the papers will help ILA in formulating standards for the Best Library Practices in the Indian Context.

Editor

Date .15-12-2001

1

The Role of Rural Community Information Services for Empowering Rural Women in Developing Countries like India.

P. KAMAIAH*

ABSTRACT

This paper presents the key missions of the Public Library envisaged by UNESCO and points out the role of information and education for empowering rural women. It highlights the concept and definition of Rural Community Resource Centres and also enlists the services of Rural Community Resource Centres/Rural Community Information Centres. It concludes with a suggestion to the Government of India to enact a National Information and Public Library Policy as a part of Public Library System in India.

1. INTRODUCTION

One may thank the Prime Minister of India for declaring the year 2001 as Women's Empowerment year. Women are the vital human resource and their empowerment—economic, educational, social and political—would hasten the pace of social development. Women with varied social, economic, political, regional, linguistic backgrounds and milieu constitute almost half of the nation's population. Women, who comprise half of the country's population need to be viewed as productive members of the society sharing equal authority and responsibilities of being citizens. Social justice also demands equal participation by women in the nation building process and other activities. Despite their infinite role in the sustenance of the family, shaping the society and peoples destinies, women generally are not treated at par with men in any of the aspects of life. The women of rural India are far worse off

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as compared to urban. The rural women in our society are exploited and denied their basic rights. Their inherent dignity and equal inalienable rights are not recognised in the society. Rural Women throughout India, irrespective of caste or religion, continue to have a subordinate status both within the home and outside.

Extent of awareness and access to education and information are prime determinant of rural women's status and role in the process of development. Also the rural women have no access to the welfare schemes meant for women introduced by state and Central Governments.

It is here that the Rural Library or community information centres or rural learning resource centres play a vital role in providing information required for the rural mass especially rural women, so as to create awareness on various activities and programmes of Central and State Governments through mass media like television, radio, printed, literature in local languages, traditional means of communication such as folk-songs, folk-dances, puppet shows, dramas, and different cultural programmes. These community information centres can also extend adult educational programmes which motivate the uneducated rural women through mass media highlighting success stories to learn and become at least functionally literate.

Thus, women are to be empowered with adequate freedom and authority to modify the programmes suitably within the overall frame work of the objectives. Experienced rural women from other areas are to be associated with monitoring the ongoing programmes to avoid any bias. Rural women who are the beneficiaries of past projects may be involved in monitoring the programmes. All these activities will be coordinated and monitored by the community information centres as a part of public library system. It is therefore, the need of the hour to activate the NAPLIS (National Policy on Library and Information System) to establish Rural Community Information Centres under public library system in all the States in India by bringing it under Concurrent list of the Constitution.

2. EMPOWERMENT OF WOMEN

The National Policy for the Empowerment of Women–1996 defined empowerment of women as " A synergy of development measures will be effected and affirmative action designed for the holistic

empowerment of women. Women will be given complete and equal access to and control over factors contributing to such empowerment, particularly, health, education, information, life—long learning for self–development, vocational skills, employment and income earning opportunities, technical services, land and other forms of property, including through inheritance, common property resources, credit, technology, and markets, etc,[1]".

Vijayalakshmi Pandit opined that women empowerment is of three fold importance:

- Education that promotes building of a positive self-image and self-confidence among women and develop the ability to think critically;
- Skill development and employment for economic independence; and
- Increasing awareness among women about health, nutrition, environment, economic and political conditions to ensure equal participation in the process of bringing social change[2].

All these three aspects are interdependent and consequently depend on the total development process. Empowerment of women is possible through the emergence of a learning society in which people of all ages and all sections of society will have access to information which is the lifeblood of the society.

3. PUBLIC LIBRARY MANIFESTO – 1994

The UNESCO Manifesto believes that the public library is a living force for education, culture and information, and as an essential agent for the fostering of peace and spiritual welfare through the minds of men and women.

The Community Information Centre or Community Information Resource Centre or Rural Public Library is a part of public library system. Therefore, it is appropriate to mention the missions of the public library as recommended by UNESCO in 1994.

The following are the key missions of the public library related information, literacy, education and culture envisaged by UNESCO[3].

(*i*) Creating and strengthening reading habits in children from an early age;

(*ii*) Supporting both individual and self conducted education as well as formal education at all levels;

(*iii*) Providing opportunities for personal creative development;

(*iv*) Stimlating imagination and creativity of children and young people;

(*v*) Promoting awareness of cultural heritage, appreciation of the arts, scientific achievements and innovations;

(*vi*) Providing access to cultural expressions of all performing arts;

(*vii*) Fostering inter-cultural dialogue and favouring cultural diversity;

(*viii*) Supporting oral tradition;

(*ix*) Ensuring access for citizens to all sorts of community information;

(*x*) Providing adequate information services to local enterprises, associations and interests groups;

(*xi*) Facilitating the development of information and computer literacy skills; and

(*xii*) Supporting and participating in literacy activities and programmes for all age groups, and initiating such activities if necessary;

4. INFORMATION AND EDUCATION FOR EMPOWERING RURAL WOMEN

Education has immense potential to bring desirable changes in the status of women in Indian society. Education will sensitise women to their rights, raise their level of aspirations and achievements.

The UNESCO World Conference on Higher Education (1998) examined the major issues of women and said that it aims to foster a gender inclusive culture through education in order to promote sustainable development and peace. The key dimensions identified in this direction are empowerment, cooperation, equity, sustainability and security[4].

We are now living in the age of information and Information Technology. Information, in general, is an idea communicated by others or obtained by personal study and investigation. In other words, information is a message conveyed or intended to be

conveyed by a systematised body of ideas. The rapid development of technology, the growth of knowledge, and the fast pace of the modern world create an increasing awareness of the importance of information. Even the common individual is in need of current information to pull on his/her day-to-day life.

Even in this Internet age, we need the libraries and their services. Nancy Kranich, the President of American Library Association, recently opined that "Librarians are human search engines. They shift through vast amounts of words and images-and arrange, organise and filter them for the public. Librarians are selective. They are critical and choosy in ways that computers will never be. Further the librarians' knowledge and skills are more valuable now that there are computers, for they can guide customers to information they need in the quickest way from the most reliable sources. Besides, not all information is available on the Internet and the information on the Internet may not help the reader. Full text books are still rare on the Internet and people still want to check out the collection of books available in libraries"[5].

Therefore, the services of libraries are essential for purpose of collection, preservation and dissemination of information to the users in the society. In this context, the public library system plays its role in dissemination of information through books, magazines, books on tapes, videos and CDs. The county libraries in the United States are also offering latest community services such as Online Book clubs, Summer Reading Programmes, Library Volunteers, Reading Volunteers, Library-On-Wheels, etc. The county libraries meant for the rural masses are called Rural Libraries/Community Information Centres/Rural Community Resource Centres.

In mid-1985 the Commonwealth Secretariat sought the views of over 200 organisations and government departments throughout the world about the need to set up the rural learning resource centres in developing countries. The outcome of this gave rise to establish the Rural Community Information Resource Centres in all developing Countries.

5. RURAL COMMUNITY RESOURCE CENTRES

Shirley Giggey has given a comprehensive definition of a Rural Community Resource Centre as "it is a place where members of a community can: find information about subjects of interest to them;

take part in learning activities; discuss and share knowledge, information and concerns with extension and other Community workers, planners and administrators; find materials to help them retain their literacy and numeracy skills; meet to organize and work together on community projects; use equipment to produce their own informational materials and enjoy culture and leisure activities."[6]

According to Diane Rosenberg, the concept of Rural Community Resource Centres arose from the conviction that rural development was being retarded by the low level of provision of reading and information materials in rural areas and that existing services – whether library, extension or mass communication – were having problems in reaching urban, let alone rural areas. The concept differs from the 'traditional' library in two ways: "Firstly, the centre is much more than a library. It acts not only as a resource centre, but also as a referral centre *i.e.* providing advice and guidance, as well as sources of information. Its resources not only cover the printed word, but also materials and media to meet the needs of non-and newly literate users. It must promote information sharing within the community, and secondly, it is urged that such a centre be established and maintained by the rural community. Most of the funds that will be required for setting up and operating the service and most of the personnel needed to manage and administer the service will have to be drawn from within the community."[7]

5.1. Services of Rural Community Resource Centres / Rural Community Information Centres

The following are the information services offered by the Rural Community Information Centres.

- Provide information which will help community members to acquire skills, knowledge and confidence to participate more actively in community affairs;
- Provide information about health and agriculture, etc. to assist communities to improve their economic situation.
- Provide information on self governance, leadership and community self management so as to help the community how to run meetings, how to plan and supervise implementation of different schemes and programmes meant for the Rural masses.

- Provide information on environment. This indeed is most required to assess the falling agricultural production as a result of soil exhaustion, scarcity of firewood, the gradual decrease of water level in streams, etc.,
- Provide a forum through which governments and other agency workers can be informed about concerns, problems and reactions of community members to their plans and programmes.
- Provide support to extension programmes and help extension workers to coordinate their work in the community.
- Strengthen a community's involvement in, and appreciation of, local and national culture.
- Serve as a focal point for community activities and enhance a sense of belonging among community members.
- Provide information support for spread of literacy which is required for on going literacy programmes.

6. ROLE OF RURAL COMMUNITY RESOURCE CENTRES / RURAL COMMUNITY INFORMATION CENTRES IN EMPOWERING RURAL WOMEN

Women empowerment is not necessarily only meant for urban working women, who have certain background and facilities available; rather it is more essential in case of rural women, who sometimes are also aware of their rights but are not able to exercise them. It is here that the services of Rural Community Resource Centres / Rural Community Information Centres are more important to meet the information needs of rural women to uplift their socioeconomic and political status.

The following are some of the important services expected of the Rural Community Information Centres.

- To establish book banks especially to help girls who are economically deprived to buy books.
- To provide an effective guidance and counselling service to each and every girl.
- To provide open learning society throughout life.
- To conduct gender sensitivity camps.

- To provide up-to-date information on State and Central Government schemes and programmes.
- To retain their literacy and numeracy through current. Information and reading materials.
- To provide on-line book clubs.
- To establish mobile libraries (library-on-wheels) to serve rural women at their doorsteps.

6.1. National Information and Public Library Policy

It is the need of the hour in India to enact a National Information and Public Library Policy to Establish and Develop the Rural Community Resource Centres as a part of Public Library System. This may be done by activating the existing National Policy on Library and Information Systems (NAPLIS) both at the State and Central levels. It is suggested that this may be included in the Concurrent list of Constitution. This will help in providing information to all Rural people especially the Farm Women, the most disadvantaged group in the Indian Society.

7. CONCLUSION

We shall remember the words of Pandit Jawaharlal Nehru "when women move forward, the family moves, the village moves, and the nation moves". Therefore, the primary concern is towards empowering women. Information is the lifeblood of the society. No society can advance without information. Women's empowerment need information on all activities of the society. The issue of 'Empowerment of Women' is incomplete unless it includes the 'Empowerment of Rural Women'. To empower rural women it is essential to establish the Rural Community Resource Centres / Rural Community Information Centres in all parts of the country. We are aware that the Commonwealth Library Association (COMLA) conducted a series of workshops on Rural Community Library and Information Resource Centres (at Sydney 1988, in Melta in 1990 and in 1991 at GIMPA, Accra) and stressed the need for establishing the Rural Community Library and Information Resource Centres in all developing countries. Therefore, let us hope that the Government of India will come forward and adopt the recommendations of COMLA and help the Indian rural society, especially rural women to uplift their social status such as socio, economic, political, cultural and educational.

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2

Library and Information Services in Changing Environment

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ABSTRACT

Tremendous growth of knowledge and information explosion have thrown challenges in procuring, organising and disseminating information for librarians and actual users. With the help of modern IT and communication technology, libraries and information centres can render their services and respond to the needs of readers. Several factors like training of library professionals, funds, Information policy, modern information technology etc. play a major role in rendering better library services to meet the demand of modern information society.

1. INTRODUCTION

The vast unabated growth of the mass of information, its proliferation and specialisation have created problems in procurings, organising and disseminating information for libraries and the actual users.

Information is considered to be a fundamental resource for social development and for the progress of individuals. People demand information that is timely, accurate, reliable, uptodate and quickly available. But the overwhelming mass of available information and its ever-increasing proportions create really a difficult problem for searching or locating information pinpointedly and expeditiously. The traditional library tools become considerably ineffective in providing specific information of an individual interest. Even the biggest library system can not afford to procure all the documents of readers' interest. The computer

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and communication technology in this stage has significant role in storing and disseminating information.

The growth and development of information technology is playing the vital and valuable role in the process of advancement of society in general and in library and information science in particular. Now in the 21st century library and information centres are facing the problem of information aburadance. So it is high time to think of some solution to tackle this problem of information management. Application of IT in the organisation and services of libraries has brought about a seachange in the functioning of libraries in the last two decades throughout the world.

The libraries in their traditional sense were storehouses of knowledge. The increasing importance of information, knowledge explosion, paucity of resources, increasing service cost , involvement of machine and other costly infrastructure have transformed libraries into information service centres

2. CHALLENGES BEFORE LIBRARY AND INFORMATION SERVICES

The present human society is undergoing a seachange due to phenomenal growth of information and application of IT in the form of computerisation and communication technology.

Information itself has no value if it are the not communicated to actual user. So information should remain information rather than mis-information. Wrong information may have its negative impact, which may damage the entire plan or strategy. Attempts should be made to minimise the misuse and abuse of information.

Storing, processing and dissemination main functions of library and information centres. Information centres and libraries have been managing information since their inception, but the information centres and libraries of today are faced with the information explosion. To cope up with information, libraries and information centres must build up their information system properly. In order to connect the seekers of information with the existing sources of information, a central system, comprising of some operational tools for organisation and control of information has to be set up. Development of computer, microelectronics, information technology and communication technology has radically changed the environment of library and information

centre.

3. STRATEGIES TO MEET THE INFORMATION NEEDS OF USERS IN MODERN LIBRARY AND INFORMATION CENTRE

When information is mishandled or poorly presented, it loses its value. So, to provide right information to the right reader at the right time, there must be changes in the library and information system. Library and Information centre must adopt appropriate techniques for storing, manipulating and disseminating the desired information. Library authorities should manipulate a proper plan to develop Information System with the application of IT and communication technology

4. STRATEGIES FOR SURVIVAL IN THE INFORMATION AGE

4.1. Establishing Information Service Committee

Information service committee must be established for policy making to create an IT environment and to meet the information explosion effectively in libraries or an information centre.

4.2. Surveys of Users' Needs

A thorough investigation of users' needs must be carried out in the reference or information desk so that the design of appropriate information products can be accomplished to extend better information service. Users' needs are mainly felt in decisionmaking and planning the information centre.

4.3. Training of Library Personnel

To serve this changing society based on information technology of the twentieth century, a comprehensive professional training programme, with emphasis on information technology should be introduced. Libraries and information centres should offer training facilities for library personnel and information scientists about the modern information technology for cultivating innovative ideas, competence, knowledge structure and technological level to do justice to the users' needs in retrieving the information.

4.4. Increase the funds

For automation and networking of libraries or to facilitate the modern information technology for utilisation of information

resources require a huge investment. For this, increased funds are required to meet the demands of modern information society

4.5. Resource Sharing

The exponential growth of literature and the rising prices of publication have put strain on the libraries, especially of developing countries like India . This has led the libraries to form a network and share the resources with partners. The development and growth of electronic information network, and the Internet in particular has provided a wide range of opportunities for provision of resource sharing through access to a greater variety of sources. Resource sharing is a way to maximise user satisfaction at lower cost. It is one of the major solutions to meet the challenges pushed by budget cut and increasing cost of publication. In India some positive effort have been made by some of the networks like INFLIBNET, DELNET, SIRNET, CALIBNET etc.

4.6. Modern Technology

The technological advancement have led to tremendous changes in the process of information generation, storage, retrieval and communication. The information technology has occupied each and every sphere around the world.

(*i*) Appropriate databases for storing and disseminating information and other technical activities of the library.

(*ii*) Facilities for electronic journal for information storage and retrieval.

(*iii*)Networking facilities: establishing networking within the libraries is a venture for the pooling , storing and optimisation of library resources. Networking facilities using communication technology for resource sharing purposes, enable the participating libraries to obtain required information of other libraries' collection by using e- mail, fax, LAN and INTERNET attached to the system.

4.7. Information System

Development of different information systems at national and international level as a source of information can also meet the challenge of modern information society. Some of these international and national information systems are AGRIS (International Information System In Agricultural Sc. And

Technology) GIS (Geographical Information System) , NISSAT (National Information System for Science and Technology) etc.

4.8. User Education and Training

It is essential to put library resources and services to efficient and effective use. It also helps the library and information professionals in getting users' feed back which helps in building up of efficient information system. It is essential to put library resources and services to efficient and effective use. It also helps the library and information professionals in getting users' feedback which helps in building up of efficient information system.

5. MEETING OF DEMAND OF USERS IN CENTRAL LIBRARY, AAU, JORHAT : A CASE STUDY

Libraries and information centres exist to support learning and research needs of their parent institution. So, libraries and information centres must be given higher priority in planning and management of effective information service to facilitate the learning and research needs. The Central Library, AAU was also established to serve its parent organisation to support learning and research needs.

Central Library has a big collection of books and Journals. The collection comprises 97,446 books, 181 current periodicals, 10,972 Bound periodicals, Theses and Dissertations, CDs, Journals, Reports etc. All these are well organised so that readers can access them easily. But with the advent of information explosion and to meet the changing demand of users, library has also moved towards the new trend of development with application of IT. Library has got sufficient funds from ICAR for strengthening the library information system.

Library has started to create databases of its holdings. It has been subscribing to CD databases of AGRIS and CAB abstracts by which users of our library are much more benefited in getting their information pinpointedly and quickly. Now library provides INTERNET based information service to readers.

Documentation section of the Central Library provides Current Awareness Service (CAS) and Selective Dissemination of Information (SDI) service by providing Current Content list, Index to Periodicals, Books Added to the library, Bibliography on different subject areas etc. These services also help the reader in

searching their information pin-pointedly

The library provides user orientation programme also about different library services, collection etc. so that readers can get acquainted with the library system easily.

But it has been observed that the readers of special and university library prefer information, which is easily and quickly accessible. Our library is also trying to bring full computerisation in the library system to facilitate quick functioning in the matters of library technical work and services. Thus the process of development towards new trend is going on and it has shifted the traditional libraries in to electronic one.

6. CONCLUSION

With the development of information and communication technology there is a seachange in the library scenario. To meet the challenges of information explosion librarian and information scientist will have a great task to do. In addition to the traditional service, library and information centre has to render its valuable services with the help of IT and respond to the needs of the readers and procure the cost effective information sources. Librarians and information scientist should evolve an effective information policy, should develop an organisational environment and co- ordinate helpful relationship with users. If all these factors work well, then there is no doubt that library and information centres can provide the best library services to meet the demand of modern Information Society.

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3

Library and Information Sources and Services in Agricultural University Libraries in Karnataka: A Study

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ABSTRACT

In this paper an attempt has been made to know the existing situation in Agricultural University libraries in Karnataka. The study found a balanced and steady growth of collections in these libraries. Financial management have been tested with Karl Pearson correlation method and found to be positive correlation between total university expenditure and total library expenditure over the eleven years. Further the study found that almost all traditional library services are available whereas the automated library and information services are totally missing.

1. INTRODUCTION

Agriculture has been the first and most ancient occupation of mankind. Agriculture began probably six to ten thousand years ago somewhere in the area between the Nile in Egypt and the valley of the Indus river in western India. Agriculture provides the basic wherewithal of existence in the form of food, clothing, and work to the people and income for those who work. It is true that man can live without manufacturing industries, but not without agriculture; one can dispense with industrial goods, but not with food. Therefore, to a great many people on the globe farming is still a way of life.

Rapid accumulation and dissemination of information will be the important feature of twenty first century. Agricultural graduates cannot afford to lag behind in this technology. Therefore a well-equipped library is must for every agricultural university, since it is the nerve center of all educational and research

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programmmes.

The agricultural universities have recognised the need for proper library and information services due to emphasis on research and the use of different methods of teaching and evaluation, wherein there is emphasis on seminars, tutorials, assignments, periodic assessment etc. And therefore teaching in such a system has to be library oriented, otherwise it would be almost impossible for a student and a research scholar to keep abreast of the developments in the educational and research pursuits. At present all the agricultural universities and their constituent colleges and research institutes have libraries of their own in the country.

In Karnataka there are two agricultural universities and about fifteen colleges attached to them. University of agricultural science Bangalore was established in the year 1964 and in 1986 university of agricultural science Dharwad started functioning, in order to cater to the diversified needs of the agricultural scientist, scholars and students of Karnataka.

2. OBJECTIVES OF THE STUDY

The main aim of the study is to know the true complexion of the existing situation, resources, facilities and services of the agricultural universities in Karnataka.

3. METHODOLOGY

Survey method was adopted to collect the required information. A structured questionnaire prepared for the purpose was circulated to both the universities and collected the required data and the same were tabulated in the tables that follow in next pages.

4. ANALYSIS AND DISCUSSION

4.1 Working Hours

The working hours is one of the important components for library services, while observing the Table-1 it is clearly indicated that both the agricultural university libraries in Karnataka are functioning twelve hours per day except on holidays, during holidays the libraries remain open for eight hours in university of agricultural science, Dharwad. On the other hand the university of agricultural science, Bangalore remains open for four hours.

Table-1

Working hours of Agricultural University Libraries

	General Days	During Exam. Period	During Holidays
UAS. Dharwad	8.00am. To 9.30pm.	8.00 am to 9.30 pm.	8.00 am to 4.30 pm.
UAS. Bangalore	8.30 am to 8.30pm.	8.30 am to 8.30 pm.	8.00 am to 12.00 pm.

4.2 Manpower

Manpower is essential for any library to run smoothly. Table-2 shows that the agricultural university library Bangalore is having adequate number of staff, on the other hand UAS Dharwad is having inadequate staff, about seventeen post of different categories are vacant and the management is waiting for clearance from the government for appointment to those posts.

Table-2

Manpower structure in UAS libraries in Karnataka

Staff	Existing		Vacant		Qualification
	UASD	.DUAB	UAS.D	UAS.B	
Professional	6	11	4	—	As per UGC
Semi-Professional	3	2	3	—	As per
UAS/C&R Rules Non-Professional	10	24	10	—	—

4.3 Library Collection

Knowledge is power and libraries are the reservoirs of this power manifest in books and other reading materials. Libraries are the temples of learning, the doors of which are open to each and everybody. The university library is a storehouse of knowledge. It is axiomatic truth that a library cannot function without an appropriate collection. The adequacy of library service is governed largely by the quantity and quality of its collection. It preserves and disseminates knowledge among the educated people and all reading and research activities radiate from the

library.

The Table-3 it clearly indicates the steady growth in the collection development of both the university libraries. with some exception here and there.

Table-3

Annual addition of books in UAS Libraries

Year	Annual addition of Books	
1990-2000	UAS DHARWAD	UAS BANGALORE.
1990	466	554
1991	2803	1553
1992	2590	275
1993	1767	1347
1994	1483	731
1995	651	990
1996	1620	508
1997	2119	561
1998	949	487
1999	824	243
2000	1413	—

Table-4 on the next page shows that agricultural university library of Dharwad subscribed 501periodicals. whereas university of agricultural library Bangalore subscribed 423 periodicals. The periodical acquisition in agricultural universities in Karnataka is done through subscription agents and from publishers.

Table-4

Journal subscription of UAS Libraries

Year	Indian		Foreign		Gratis	
	UASD	UASB	UASD	UASB	UASD	UASB
1990	264	422	221	360	59	135
1991	277	422	221	360	53	135
1992	278	304	213	259	53	134
1993	207	286	232	277	53	135
1994	235	321	238	246	27	142
1995	260	301	244	260	55	96
1996	260	291	242	259	55	147
1997	263	291	237	243	55	150
1998	264	311	237	207	55	150
1999	263	311	238	112	55	150
2000	263	311	238	112	55	150

4.4 Library Finance

Finance is essential for running any institution properly. The authorities should guarantee stable and adequate financial support to the various institutions created by them. This becomes all the more important if the institutions are to render satisfactory and efficient services to the community. No scheme or plan can meet any appreciable success in the absence of adequate funds. Finance plays a significant role in the organisation and administration of the library. A library has to purchase books and periodicals, get modern furniture, construct and maintain the building and employ trained staff.

Table-5 indicates the existing provisions for library budget in the two universities. It shows that over the years the amount is changing in nature. In agricultural university library Dharwad it ranges from Rs. 75,000 to Rs. 12,00,000. On the other hand in Bangalore agricultural university it ranged from Rs. 23 lakhs to Rs.91 lakhs.

Table-5

Annual library grants

Year	Library Budget	
	Dharwad	Banglore
1990	6,00,000	23,28,000
1991	12,00,000	39,00,000
1992	9,18,000	36,11,800
1993	9,50,000	74,38,000
1994	7,80,000	66,02,000
1995	1,00,000	69,21,000
1996	4,00,000	69,27,000
1997	2,90,000	81,80,000
1998	3,05,000	91,57,000
1999	3,50,000	82,59,000
2000	75,000	83,00,000

We have made an attempt to study the proportion of university library expenditure to total university expenditure in UAS Bangalore. Table-6 shows that the proportion of expenditure range from 1.3 per cent to 6.5 per cent over the years. In 1990 it was 6.5 per cent fallowed by 1.5 per cent in the year 1991, 1.3 per cent in the year 1992, 2.3 per cent in the year 1993, 1.6 per cent in the year 1994, 1.8 per cent in the year 1995, 1.7 per cent each in of the year 1996 and 1997, 1.6 per cent in the year 1998,1.1 per cent in the year 1999,1.3 per cent in the year 2000. While observing the table it can be inferred that the consistency is maintained over the years with some exception in 1990 and 1993. The co-effient of correlation between the total university expenditure and total library expenditure of university of agricultural science library of Bangalore has been calculated and given in the Table-7. Two variables are said to be correlated when the movement or the changes in one is followed directly or indirectly by movements or changes in the other, and greater the magnitude of change in one, the greater is the change in other also.

Table-6

Proportion of university library expenditure to total university expenditure in UAS Bangalore

Year	Total Uni.Expen.	Total Lib.Expen.	Percentage
1990	35, 7,20,000	23,28,000	6.52
1991	25,76, 18,000	39,00,800	1.5
1992	26, 68, 91,000	36,11,800	1.3
1993	32,75,86,000	74,38,000	2.3
1994	36,34,31,000	60,02,000	1.6
1995	37,21,41,000	69,21,000	1.8
1996	39, 98, 69,000	69,27,000	1.7
1997	47,05, 90,000	81,80,000	1.7
1998	54,43,58,000	91,57,000	1.6
1999	74,98,67,700	82,59,000	1.10
2000	66,01,95,000	83,00,000	1.3

Table-7

Correlation of total university expenditure and total library expenditure of UAS Bangalore (rounded to nearest lakh rupees)

Year	University Expenditure				Library Expenditure		
	M1	X	X2	M2	Y	Y2	XY
1990	357	-3364	11,31,6496	23	-46	2116	1,54,744
1991	2576	-1145	13,11,025	39	-30	900	34,350
1992	2669	-1052	11,06,704	36	-33	1089	34,716
1993	3276	-445	1,98,025	74	+5	25	-2225
1994	3634	-87	7569	60	-9	81	783
1995	3721	0	000	69	0	0	000

(contd. from previous page)

1996	3999	278	77,284	69	0	0	000
1997	4706	985	9,70,225	82	13	169	12,805
1998	5443	1722	29,65,284	92	23	529	39,606
1999	7499	3778	1,42,73,284	83	14	196	52,892
2000	6602	2881	83,00161	83	14	196	40,334

Σx 3551 $\Sigma x2$ 40526057 Σy–49 $\Sigma y2$ 5301 Σxy 368005

By applying the Karl Pearson's formula to the data of Table-7, we get

$$= \frac{(\Sigma xy - n((\Sigma x)/n)((\Sigma y)/n))}{(n\sqrt{(\Sigma x^2/n - (\Sigma x/n)^2}\ \sqrt{\Sigma y^2/n - (\Sigma y/n)^2}}$$

$$= \frac{(368005 - 11(3511/11)(49/11)}{(11Ö40526057/11 - (3551/11)^2Ö5301/11 - (49/11)^2}$$

$$= \frac{368005 - 15640}{(11Ö\ 3684187 - 104209\ Ö\ 318.3 - 19.82}$$

$$= \frac{368005 - 15640}{11x1892x17.3)}$$

$$= \frac{352365}{360047.6}$$

$$= +0.97$$

The answers prove that there is very high degree of positive correlation between the total university expenditure and the total library expenditure over last eleven years.

5. LIBRARY AND INFORMATION SERVICES

Library is essentially a service institution, so is the university library. The traditional functions of the library services involve a variety of activities on the part of the library. To achieve its goals and realise its policies, a library undertakes different services. The university library is no exception to this. Both the university libraries under the study were offering reprographic reader services such as circulation, reference, bibliographical documentation and information services such as CAS and SDI.

As regards the automated library services and use of different database facilities the present study found an unsatisfactory situation in both the university libraries.

While observing the Table-8 one finds that none of the university libraries under the investigation has automated cataloguing, acquisition, circulation, periodical control, reference and OPAC.

Table-8

Automation *I's*. Library Services

Library section	UAS.D		UAS.B	
	Yes	No	yes	no
Cataloguing and Indexing		*		*
Acquisition		*		*
Circulation		*		*
Periodical control		*		*
Reference		*		*
OPAC		*		*

On the other hand (Table-9) automated CAS services and CD-Rom search is available at UAS Bangalore, whereas in UAS Dharwad CD-Rom search and Internet browsing is available to its users.

Table-9

Library Services

Library services	UAS.D		UAS.B	
	yes	no	yes	no
Automated lending		*		*
Automated CAS		*	*	
Automated translation		*		*
E-mail		*		*
Telex		*		
Fax		*		*
CD-Net	*			*
Dialup service		*		*
Technical communication		*		*
Electronic Bulletin board service		*		*
CD-ROM Search	*			*
Online Search		*		*
Internet browsing	*		*	
WEB-BASED OPAC		*		*
Telnet		*		*
Voice Chatting		*		*

Table-10 clearly shows that the UAS Dharwad is having book database whereas in UAS Bangalore current periodical and thesis and dissertation database is available to the users.

Table-10

In-house Database facilities

Database	UAS.D		UAS.B	
	Yes	no	yes	no
Current periodicals		*	*	
Back volumes		*		*
Thesis and dissertation		*	*	
Books	*			*

6. CONCLUSION

On account of the financial inadequacy, lack of proper administrative structure within the library, lack of professionally trained staff, and non-availability of mechanical and IT devices, the university of agriculture science libraries in Karnataka are limiting themselves to the traditional functions and services of the library. Frankly speaking, the concept of Information Technology is completely missing. To overcome this situation, it is suggested that the librarian and his staff come forward to introduce new services in order to satisfy the diversified requirements of the user community. For this purpose they are required to introduce information technology properly and adequately. Hence, it is suggested that the concerned authorities should appoint a committee for the purpose and introduce the Information technology and provide effective information services to their users.

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4

Library and Information Services in Central Library, Acharya N.G. Ranga Agricultural University, Hyderabad

K. VEERANJANEYULU*

ABSTRACT

The paper deals with the need to extend good library services for research in agricultural and allied fields of study and describes the activities of the Acharya N.G. Ranga Agricultural University, Hyderabad and its library system. It gives detail of the services, specially those which are IT based.

1. INTRODUCTION

The progress of research in agricultural fields and improvement of production, essentially requires timely supply of information to agricultural scientists. It is not possible to achieve self-sufficiency in food production without adequate information supply to agricultural scientists.

The concentration of efforts is probably efficacious in informing agricultural scientists of improved methods in agriculture. It also indicates an unfortunate parochialism effecting both the agricultural scientists and the information handling industry. To promote an effective working relationship between research workers who generate new agricultural knowledge, and farmers who stand in need of such knowledge, the information system acts as 'middlemen' in a position to deliver such knowledge to the required points of distribution. The sources of agricultural information are varied in kind and widely scattered in location with an equally widespread distribution. In the same way agricultural information users are also equally scattered. To bridge

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this gap, we need agricultural information system.

So far as the structure of the Agricultural Information Service is concerned, we should remember that in this complex world it is not possible for any individual agricultural library to meet the complete information requirements of the users. The users' requirements are becoming more and more diverse in the quantities and qualities. We also find time factor as pressure on the supply of agricultural information. There is also an imperative need for widening information coverage, extending the sphere of services and accelerating the speed in the supply of information.

It is essential to build the requisite information infrastructure for agricultural scientists within the state and nation. This is particularly relevant in the context of 'food for all'. In pursuit of scientific excellence, agricultural information infrastructure is a must and agricultural information service facility keeps track of the latest scientific, agricultural and technological advances all over the world.

2. ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY

The Acharya N.G. Ranga Agricultural University was established on 12th June 1964 under the APAU Act 1963. The objectives of the university are to make provision for education, mainly of the rural people of the state of Andhra Pradesh in agriculture and to promote research extension programmes in agriculture and thereby increase agricultural production. Acharya N.G. Ranga Agricultural University, besides producing technical manpower, envisages a strong integration of teaching, research and extension through their balanced development.

The Acharya N.G. Ranga Agricultural University has 15 teaching institutions under three faculties. There are six agricultural colleges, three colleges of Veterinary Science, two Colleges of Home Science, one college each of Agricultural Engineering and Fisheries Science and two Agricultural Polytechnics.

Research in the university is mainly concentrated in the fields of agriculture, livestock, fisheries and home science. The research work is going on at 67 research stations in seven agro-climatic zones with a wide network located in the state. In addition, a total of 241 research schemes, All India Coordinated Research Projects (ICAR) and schemes sponsored by Government of India and others

are in operation.

The extension activities of the university are focused on testing and verification of new technologies developed by the scientists through on-farm trials and early demonstrations, training of the farmers, farm women, rural youth and personnel of the state developmental departments for updating their knowledge and skills. The university extension system is also involved in disseminating the information through Press, Television, All India Radio and by organising *Kisan Melas.*

3. ANGRAU LIBRARY SYSTEM

With a view to cater to the library and information needs of teachers and students as well as that of research and extension personnel, the library system was reorganised in 1980 forming Central Library at Hyderabad, Regional Libraries at Tirupati and Bapatla and College Libraries at Bapatla, Naira, Muthukur, Aswraopet, Mahanandi and Gannavaram.

The libraries function under the overall control of the university Librarian who is one of the statutory officers of the university, directly responsible to the Vice-Chancellor. The Central Library is managed by the university Librarian and the regional Libraries and college Libraries by the Assistant Librarians.

4. CENTRAL LIBRARY, ANGR AGRICULTURAL UNIVERSITY

The Central Library is located near the Administrative Office and the branch libraries are present at Veterinary College and Extension Education Institution. The Central Library has a beautiful building of three floors with carpet area of 4645 sq. mts. and seating capacity for about 250 readers.

4.1. Collection

The Central Library has 90,000 documents and subscribes to over 500 Indian and foreign journals. Many more journals and reports are being received from national and international institutes on gratis and on exchange of 125 copies of 'ANGRAU Research Journals'. Library maintains one copy of the dissertation submitted by postgraduate students and research scholars of all the main campus colleges.

4.2. Users

There are the four categories of users using Central Library.

1. Agricultural Scientists (Teaching, Research and Extension)
2. P.G. Students (M. Sc (Ag), M. Sc (Hort), M.V. Sc and Ph.D.)
3. Under-Graduate students (B. Sc (Ag), B. Sc (Hort) and B.V.Sc)
4. Non-teaching staff

5. INFORMATION TECHNOLOGY INFRASTRUCTURE

The information technology infrastructure in ANGRAU Central Library are as follows.

5.1. Hardware

LAN Server

Internet Server

CD Net Server

Computers – 486, Pentium, Pentium II and Pentium III

Laptop

Laser printer

Dot Matrix printers

Inkjet printer

CD-Writer

HP-Scanner

Bar coding machine

Fax

Nodes – 18

Modem

5.2. Software

CDS/ISIS

LIBSYS

WINDOWS 1995, 1998 and 2000

Novel Netware

MS Office 2000

5.3. Others

Microfilm Reader

Television

VCR

6. USE OF INFORMATION TECHNOLOGY IN ANGRAU CENTRAL LIBRARY

The ANGRAU Central Library is using information technology for providing effective services to the users. The Central Library is using information technology in the following areas :

6.1. Library house-keeping operations

- Acquisition
- Cataloguing
- Serial Control

6.2. Information Services

- OPAC
- Internet Services
- E-Mail Services

6.3. Library Networking

- Local Area Networking
- Wide Area Networking

6.4. Office Automation

- Word Processing
- Accounting

7. LIBRARY INFORMATION SERVICES AT ANGRAU CENTRAL LIBRARY

The rapid development in information technology has changed the routine functioning of libraries. This has emphasised the need for automation which has made an impact on all library services. The ANGRAU Central Library provides the following information services, in addition to the regular library services, to its users.

(*i*) Internet Access facility

(*ii*) E-mail Services

(*iii*) CD-ROM Search Services

(*iv*) Career guidance cell

(*v*) Reprography services

(*vi*) Book Bank Schemes

(*vii*) Network services

(*viii*) Current Awareness Services

7.1. Internet and E-mail Facility

The Internet is undoubtedly a effective medium between the information professional and information. In present times, it is an essential requirement for the information personnel to know how to access the facilities available through this new technology. The Internet has become an expert too far in searching to satisfy the users' needs. Internet is the global information infrastructure which enables the professionals to access the information and communicate to the users easily and cost-effectively through a variety of media such as text, graphics, voice, etc. *i.e.* multimedia.

Central Library has introduced Internet and E-mail facility for the agricultural scientists and students.

The Central Library is charging a nominal fee of Rs. 10/- per hour to extend Internet and E-mail facilities to the users.

7.2. CD-ROM Search Services

CD-ROM databases are the best, powerful and cost-effective tools for information.storage and retrieval. Information that can be stored and retrieved in a CD-ROM can be of different forms, *viz.*, textual, audio, still images, digital video and amination. Some of the salient features of CD-ROM searches are :

- search can be made quickly and efficiently in free text mode and by using field qualifiers namely author, keyword, journal title, publisher, year of publication, etc.
- Boolean operators like AND, OR, NOT can be used to broaden or limit the search.
- The search so made can be displayed, printed and even downloaded.

The ANGRAU Central Library provides CD-ROM based database searches by subscribing to Common Wealth Agricultural Bureau Abstracts. The users have to apply for this service in the prescribed proforma duly indicating 8 key words of their topic

The printouts are charged at the rate prescribed by the university. The charges are Rs. 0.50 per print of each abstract, Rs. 0.50 per page for the citation prints and Rs. 10.00 per search for document loading in the personal floppy.

7.3. Career Guidance Cell

ANGRAU Central Library has opened an exclusive section called 'Career Guidance Cell' to cater to the needs of search of those readers who appear for competitive examinations and ASRB examination. It also provides information on higher education in India and abroad. Books pertaining to all the competitive examinations and brochures and handbooks of higher education are housed in this section.

7.4. Reprography Services

Photocopying facility is available in the Central Library. The photocopying service is being rendered on self-supporting basis by charging 50 paise per page. The income thus received is utilised for sustaining the reprography services.

7.5. Book Bank Schemes

The following book bank services are available in the Central Library

- Book Bank Scheme
- B.C. Students Welfare Scheme
- SC/ST Students Welfare Scheme

7.5.1 Book Bank Scheme

Under the scheme, multiple copies of text books are purchased and made available to the students on a nominal charge for one semester without any fine

7.5.2 B.C. Students Welfare Scheme

Realising the importance of books in support of class room teaching and with a view to make the books accessible to economically backward class students, under this scheme two books are issued to each student for one semester.

7.5.3 SC/ST Students Welfare Scheme

In addition to the book allowance provided by the state Government for SC/ST students, a separate provision was made to build up the collection of books useful for competitive examinations taken by the SC/ST students.

7.6 Network Services

LAN connectivity has been established in the Central Library and building up of Online Public Access Catalogue using LIBSYS software is on the anvil.

The support for campus networks was obtained in 1996 through ICAR under its Agricultural Research Information System (ARIS) programme, which was financed by World Bank. Collaboration among scientists in India, systematic access to research information available in India as well as in other countries. better project management of agricultural research and modernisation of the office automation tools used by the scientists and administrators are the major goals of ARIS programme. It envisages point to point connectivity to all state agricultural universities, research institutions under ICAR, project directorates, national research centres and zonal research stations through a national network. ARIS consists of modules, Agricultural Management Information System (ARIMS), Agricultural Research Personnel Information System (ARPIS), Agricultural Research Financial Information System (ARFIS), and Agricultural Research Library and Information System (ARLIS).

The Central Library is part of Agricultural Research Library and Information System (ARLIS). It acquired required Infrastructure under this project.

7.7 Current Awareness Services

A monthly current awareness bulletin "Current Agricultural Titles" is published and being mailed to all the Research Stations. The service is backed up with the supply of photocopies of articles required by the scientists at the Research Stations.

8. CONCLUSION

The library and information services is a challenging task of satisfying the increasingly complex and diverse information needs of the users. A wide variety of technology options that exists now

are regularly updated so that libraries can function according to the new trends, because the technology itself, is going to change even more rapidly. Realising the need for efficient and effective storage and retrieval of information, which is of crucial importance to both the librarians and the users, the ANGRAU Central Library has indeed been providing specialised services to its users.

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5

Agriculture Research Information System: Strategies for Quality Agricultural Information Services

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ABSTRACT

The paper discusses Agricultural Research Information System (ARIS) in India and its various modules like Agricultural Research Personnel Information System (ARPIS), Agricultural Research Financial Information System (ARFIS), Agricultural Research Management Information System (ARMIS) and Agricultural Research Library Information System (ARLIS). It also describes the Information System Development (ISD) and ARIS Cells, their funding and computer equipment availability.

1. INTRODUCTION

Like other fields, agricultural development in the country has faced new challenges in the just commenced 21st century. India is a vast country with agricultural diversity. Of the hundred crore population 70per cent live in 6 lakh villages cultivating 184 million hectare land broadly demarcated into 20 agro climatic zones and harnessing 2.02 million sq. kms. of exclusive economy zone around 8129 km. tropical coast line.

With the advent of computers and telecommunications network, quick access to information provides the way to meet

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the challenges of Indian agriculture. The National Agricultural Research System (NARS) of India caters to the need of agricultural research and education. It has a vast network of 48 Central Institutes, 4 Bureaus, 10 Projects Directorates (PDs), 30 National Research Centres (NRCs), 86 All India Coordinated Research Projects (AICRPs) and 261 Krishi Vigyan Kendras (KVKs) of the Indian Council of Agricultural Research (ICAR), 29 State Agricultural Universities (SAUs) with 120 Zonal Research Stations (ZRSs) and one Central Agricultural University (CAU). It caters to the needs of more than 30,000 Scientists working in these institutions.

2. PROJECT-AGRICULTURAL RESEARCH INFORMATION SYSTEM (ARIS)

With the currently witnessed revolution in information technology, access to desired information by working scientists and research managers has assumed paramount importance. With this in view, ICAR through its project, Agricultural Research Information System (ARIS) is developing infrastructure at majority of sites of National Agricultural Research System by developing databases and access to information. The Government of India is providing funds. Also, World Bank has provided Rs.40 crore under National Agricultural Research Project (NARP) and Rs.130 crore for Information System Development (ISD) under National Agricultural Technology Projects (NATP).

Agricultural Research Information System (ARIS) was initiated by the ICAR in 1991 with a goal to strengthen the information management culture using modern tools within Indian NARS. The objectives of ARIS are:

(*i*) to bring information close to the managers and scientists,

(*ii*) to build the capacity to organise, store, retrieve and use the relevant information into the agricultural research infrastructure,

(*iii*) to share information over NARS, and

(*iv*) to improve the capacity to plan, execute, monitor and evaluate research programmes.

2. ARIS MODULES

The ARIS has 4 information modules, namely Agricultural

Research Personnel Information System (ARPIS), Agricultural Research Financial Information System (ARFIS), Agricultural Research Management Information System, (ARMIS), and Agricultural Research Library Information System (ARLIS). It also has an Agricultural Research Information Centre (ARIC).

2.1. Agricultural Research Personnel Information System (ARPIS)

It keeps information on the ICAR Scientists, and technical and administrative personnel to provide access to information like cadre, strength, position etc. according to sex, caste, state, institute, discipline etc. to help in personnel policies , manpower planning, recruitment and specialisation.

2.2. Agricultural Research Financial Information System (ARFIS)

For organisations, schemes and accounting heads ARFIS has developed a software package for computerised accounts. Version 2.21 of the software package has been developed and has been made mandatory for of accounting purposes.

2.3. Agricultural Research Management Information System (ARMIS)

It provides information for decision making related to effective planning, priority setting ,monitoring and evaluation of scientific research, management of physical, personnel and financial resources, organisational restructuring, and policy initiative. A software has been developed for the purpose.

2.4. Agricultural Research Library Information System (ARLIS)

The ARLIS envisages online access by Indian agricultural scientists to:

(*i*) the international databases and scientific literature,

(*ii*) the new databases on Indian agricultural and socio-economic research and development to be created under ARLIS, and

(*iii*) the external databases accessible through the World Wide Web.

Efforts are being made to create more CD-ROM libraries at

centralised locations accessible to all concerned. The IARI library is being developed as a National Library in agricultural field. National libraries in other allied fields are also being developed.

2.5 Agricultural Research Information Centre (ARIC)

Besides the four modules mentioned above, ARIS maintains an Agricultural Research Information Centre (ARIC). It provides information in all research projects and schemes financed by the ICAR. It is the national input centre for AGRIS and CARIS of the FAO. It is also the national focal point for the SAARC Agricultural Information Centre (SAIC).

3. ISD : INFORMATION SYSTEM DEVELOPMENT

Under National Agricultural Technology Project (NATP), ARIS has worked on Information System Development. It is supporting ARIS and Library Improving and Networking (LIN) for making full use of the opportunities provided by modern information technology so that Indian NARS can face challenges of the subsistent growth of agriculture. Its main aims are to strengthen information management within Indian NARS by developing linkage among NRCs, PDs, SAUs and ZRSs and KVKs. This network provides access to internet , national and International scientific literature , databases and CD- ROM libraries. The major objectives of ISD are :

(*i*) to put information close to the managers and scientists who will use it.

(*ii*) to improve the capacity of researchers and research organisations to organise, store and retrieve information relevant to their mandates.

(*iii*) to develop regular procedures and mechanisms for those organisations to share information.

(*iv*) to improve the capacity to plan, monitor and evaluate research programs.

(*v*) to strengthen national level library network for electronic access.

To achieve the above objectives ISD has planned many activities to be undertaken by the end of March 2003. These include creation of Local Area Network (LAN), system integration, electronic connectivity, training of staff, development

of databases, development of National Libraries at IARI, IVRI, NDRI, and CIFE in their respective disciplines, development of scientific abstracts, access to libraries in India and abroad and training of library staff, etc.

3.1. ARIS Cells :

The ISD project supports expedition of electronic connectivity of the ARIS down to divisional level within all ICAR Institutions, links all SAUs with there ZRSs and provides access to World Wide Web. Accordingly for adequate control mechanisms and system support, ARIS Cells have been created . The list of ARIS Cells are given in Table 1.

S.No.	State	SAUs	Instututes	PDs	NRCs	Bureau	Total
1	Delhi (Capital)	-	2	1	3	1	7
11	NE & EASTERN STATES						
112	Bihar	1	-	1	-	-	2
113	Uttar Pradesh	2	8	2	1	1	14
124	Jharkhand	1	1	-	-	-	2
125	West Bengal	2	3	-	-	-	5
126	HIMALYAN STATES			-	-		
1261	Arunachal Pradesh	-	-	-	1	-	1
1262	Assam	1	-	-	-	-	1
1263	Manipur	1	-	-	-	-	1
1264	Meghalaya	-	1	-	-	-	1
1265	Mizoram	-	-	-	-	-	-
1267	Nagaland	-	-	-	1	-	1
1268	Sikkim	-	-	-	1		1
1289	Tripura	-	-	-	-	-	-
13	SE& SOUTHERN STATES						1311
	Andaman & Nicobar I UT	-	1	-	-	-	1
1322	Lakshadweep (I) (UT)	-	-	-	-	-	-
131	Andhra Pradesh	1	3	3	3	-	10
132	Chhattisgarh	1	-	-	-	-	1
133	Kerala	1	5	-	-	-	6

134	Orissa	1	2	-	2	-	5
135	Pondicherry	-	-	-	-	-	-
136	Tamil Nadu	2	2	-	1	-	5
14	SW&WESTERN STATES						141
	Dadra &Nagar Haweli UT	-	-	-	-	-	142
	Daman & Diu (UT)	-	-	-	-	-	-
143	Goa	-	1	-	-	-	1
144	Gujarat	1	-	-	2	-	3
145	Karnataka	2	2	1	1	-	6
146	Maharashtra	4	3	-	3	1	11
15	CENTRAL STATES						
151	Madhya Pradesh	1	2	1	3	-	7
16	N W STATES						
161	Chandigarh (UT)	-	-	-	-	-	-
162	Haryana	1	3	1	1	1	7
163	Punjab	1	1	-	-	-	2
164	Rajasthan	2	3	-	3	-	8
17	NORTHERN STATES						
171	Himachal Pradesh	2	1	-	1	-	4
172	Jammu & Kashmir	1	1	-	-	-	2
173	Uttaranchal	1	2	-	1	-	4
	Total	**30**	**47**	**10**	**28**	**4**	**119**

For the LAN creation SAUs have been provided Rs. 15 lakh for the headquarters and Rs. 7 lakh for ZRs. Rs.5 Lakh are allowed to create ARIS Cell at the HQ. and at the ZRs. Rs. 5 Lakh are also provided for renovation of existing space of about 400 Sq ft. each at 49 ICAR Institutes and 10 PDs . E-mail connectivity has been established at 94 ICAR constituents (49 institutes, 10 PDs and 17 NRCs, 18 SAUs) by linking these institutes through dial-up including 17 ICAR institutes with VSAT connectivity using NICNET. 33 additional VSATs were installed . The table shows financial support extended to SAUs and ZRs under NARS and NATP. Rs. 1901 lakh have been provided to these Institutions for creating ARIS Cells (Table 2)

Table 2 : Funds Provided to SAUs for ARIS Cells and LANs

S. No.	Name of SAUs	No of ZRS	Fund Provided for ARIS Cell & LAN (Rs. in Lakh)	No. of ZRs Station College	Funds Provision for ARIS Under UNDP
1.	AAU, Jorhat (Assam)	6	57.00	6	24.00
2.	APAU, Hyderabad (A.P.)	7	64.00	12	48.00
3.	BAU, Kanke (Bihar)	3	36.00	3	12.00
4.	BCKV, Mohanpur (W.B.)	6	57.00	4	16.00
5.	CSAUA &T , Kanpur (U.P.)	3	36.00	4	0.00
6	GAU, Banaskantha (Gujarat)	8	71.00	11	44.00
7.	GBPUA&T, Pantnagar (U.P.)	4	43.00	7	28.00
8.	HAU, Hissar (Haryana)	2	29.00	8	32.00
9.	HPKV, Palampur (H.P.)	2	29.00	4	16.00
10.	IGKV, Raipur (Chhattisgarh)	3	36.00	3	12.00
11.	JNKVV, Jabalpur (M.P.)	9	78.00	10	40.00
12.	KAU, Vellanikkara (Kerala)	5	50.00	8	32.00
13.	KKV, Dapoli (Maharashtra)	2	29.00	3	12.00
14.	MAU, Parabhani (Maharashtra)	1	22.00	7	28.00
15.	MPKV, Rahuri (Maharashtra)	4	43.00	7	28.00
16.	NDUA&T, Faizabad (U.P.)	3	36.00	3	12.00
17.	OUA&T, Bhubaneshwar (Orissa)	10	85.00	8	32.00
18.	PAU, Ludhiana (Punjab)	5	50.00	6	24.00
19.	PDKV, Akola (Maharashtra)	2	29.00	5	20.00
20.	RAU, Bikaner (Rajasthan)	9	78.00	8	32.00
21	RAU, Udaipur (Rajasthan)	-	-	-	-
22.	RAU, Pusa (Bihar)	3	36.00	6	24.00
23.	SKUAS&T, Srinagar (J&K)	4	43.00	4	0.00
24.	TNAU, Coimbatore (T.N.)	7	64.00	10	40.00
25.	TNV&ASU, Channai (T.N.)	0	15.00	3	12.00
26.	UAS, Bangalore (Karnataka)	6	57.00	11	44.00
27.	UAS, Dharwad (Karnataka)	4	43.00	7	28.00

S. No.	Name of SAUs	No.of ZRS	Fund Provided for ARIS Cell & LAN (Rs. in Lakh)	No. of ZRs Station College	Funds Provision for ARIS Under UNDP
28	WBAFS, Calcutta (W.B.)		-	2	8.00
29	YSPUH&F, Solan (H.P.)	2	29.00	2	8.00
30.	Central Agricultural University	-	-	-	-
	Imphal (Manipur)				
	Total	120	1245.00	172	656.00

Note : For creating LANs for SAUs , PDs , and NRCs, ICAR Hq., DO E /DAC and PIU a total of Rs. 2636.50 lakhs have been allocated for the years 1998-99 to 2002-3 as shown Table 3

Table 3: Financial Requirements of LAN Establishment under NATP (Cost :Rs. In lakh)

Item	Capacity	Unit cost (Rs.)	1998-99		1999-00		2000-01		2001-02		2002-03		Total	
			No	cost	No	cost	No	cost	No	cost	No	cost	No	cost
Establishment of Local Area Network	SAUs	1600000	10	160.00	50	800.00	-	-	-	-	-	-	60	960.00
	Institute/ PDs / NRCs	1000000	16	160.00	70	700.00	-		-	-		-	86	860.00
	ICAR Hqrts	3500000	2	70.00	0	0.00	-	-	-	-	-	-	2	70.00
	DOE/ DAC	1000000	7	70.00	10	100.00	9	90.00	-	-	-	-	26	260.00
	PIU	1500000	1	15.00	0	0.00	-	-	-	-	-	-	1	15.00
Sub- Total	-	-		475.00		1600.00	-	90.00	-	0.00	-	0.00		2165.00
LAN at MANAGE (with 30 nodes)	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Operation &	-	-	-	-	-	-	-	47.50	-	207.50		216.50	-	471.50
Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		-		475.00	-	1600.00		137.50		207.50		216.50		2636.50

Table 4 : Break- up of the financial outlay of the ARIS							
S.N.	Head	Year wise total requirement of funds (Rs. in lakh)					
		Iyr	IIyr	IIIyr	IVyr	Vyr	Total
A.	Recurring						
	i) Pay & Allowances	0.00	0.00	0.00	0.00	0.00	
	ii) T.A.	1.00	2.00	2.00	2.00	2.00	9.00
	iii) Training	72.80	137	177.45	76.65	10.40	474.50
	iv) workshop	2.00	4.00	2.00	0.00	0.00	8.00
	v) Consultincy	6.86	6.28	7.90	6.84	7.80	35.68
	vi) Contingencies	204.00	564.00	185.81	364.47	420.54	1738.82
	(a) AMC	34.00	34.00	136.31	364.47	420.54	989.32
	SAUs	-	-	17.50	71.50	99.36	188.36
	ICAR Institutes	-	-	15.25	47.30	62.13	124.68
	PDs/ NRCs	-	-	5.38	11.65	11.65	28.68
	AICRPs	-	-	10.32	10.32	10.32	30.98
	DOE	-	-	6.36	16.20	20.58	43.14
	Local Area Network	-	-	47.50	207.50	216.50	471.50
	Equipment under	34.00	34.00	34.00	-	-	102.00

	NARP	-	-	-	-	-	-
	(b) Local Area Network (works)	142.50	480.00	27.00	-	-	649.50
	(c) Database Development	27.50	50.00	22.50	-	-	100.00
Sub - total		**286.66**	**713.48**	**375.16**	**449.96**	**440.74**	**2266.00**
B	Non - recurring						
	i) Works	1077.00	0.00	0.00	0.00	0.00	1077.00
	ii) Computing equipment	1096.10	2043.20	941.30	32.00	0.00	4112.60
	SAUs	350.00	1080.00	557.20	-	-	1987.20
	ICAR Institutes	305.00	641.00	296.50	-	-	1242.50
	PDs & NRCs	107.50	125.50	-	-	-	233.00
	AICRPs	206.40	-	-	-	-	206.40
	DOE	127.20	196.70	87.60	32.00	-	443.50
	iii) Local Area Network	332.50	1120.00	63.00	-	-	1515.50
	iv) Software	200.00	132.00	100.00	-	-	432.00
Sub - Total		**2705.60**	**3295.20**	**1104.30**	**32.00**	**0.00**	**7137.10**
	*Total	2992.26	4008.68	1479.46	481.96	440.74	9403.10

**** Now, 108 KVKs are proposed to be included under ISD for which no provision was made***

Table 5 : Break-up of the financial outlay of the Library Information Network

S.No.	Head	Total requirement of funds (year - wise) (Rs. in lakhs)					
		1998-99	99-2000	2000-01	2001-02	2002-03	Total
A.	**Recurring**						
	i) Pay & Allowances	10.10	10.10	11.70	12.40	13.10	58.20
	ii) T.A.	1.00	1.00	1.00	1.00	1.00	5.00
	iii) Training	20.00	40.00	50.00	50.00	40.00	200.00
	iv) Workshop	2.00	200.00	200.00	2.00	2.00	10.00
	v) Contingencies**	250.00	250.00	250.00	250.00	250.00	1250.00
	Total (A)	**283.10**	**303.90**	**314.70**	**315.40**	**306.10**	**1523.20**
B.	**NON - RECURRING**						
	i) Equipments	178.10	529.50	-	-	-	707.60
	ii) Software	93.40	21.40	35.00	30.00	14.20	194.00
	Total (B)	**271.50**	**550.90**	**35.00**	**30.00**	**14.00**	**901.60**
C.	**CIVIL WORKS/**	525.00	236.00	-	-	-	761.00
	Total (A+B+C)	**1079.60**	**1090.80**	**349.70**	**345.40**	**320.30**	**3185.80**

*** Includes subscription to National, International Journals, CD-ROMs, Internet fee and site licensing fee etc.*

S.No.	Post(s) with Designation	Pay Scale	No. of posts which can be filled up by redeployment	No. of incremental posts (to be created afresh)	Total requirement
1.	Electronic information specialist (T-6)	8000-13,500	Nil	4	4
2.	Documentation delivery officer (T-5)	6500-10,500	2	2	4
3.	Acquisirion officer (T-5)	6500-10,500	Nil	4	4
4.	Serial control officer (T-4)	5,500-9,000	Nil	4	4
5.	Indexer (T-4)	5,500-2,900	4	NIL	4
	Total		**6**	**14**	**20**

4. COMPUTER EQUIPMENTS

For the development of ARIS Cells in various institutions the computer equipments have been provided . At each SAU headquarters, ZRS, ICAR Institute, PD, and NRC, at least one LAN server, 3 or 4 PCs, 1 Laser Printer, one UPS, one Modem and 2 ACs, were provided by the end of 1996-97. 27 SAUs and 31 big ICAR Institutes have been provided with one Unix server for electronic connectivity. The summary of the computer equipments supplied is shown in table 6.

Table 6 : Summary of Computer Equipments supplied to SAUs and ICAR Institutions under NARP							
Equipments	SAUs (Total=27)	ZRs (Total=120)	ICAR Institutes (Total=2)	ICAR & PDs (Total=45)	Bureaus (Total=14)	NRCs (Total=27)	Total (235 Institutions)
UNIX Server- 32 Users	7	-	-	5	-	-	12
UNIX Server- 16 Users	20	-	-	3	-	-	23
UNIX Server- 8	-	-	2	19	2	-	23
LAN Server-32 Users	27	-	-	17	2	-	46
LAN Server-16 Users	-	28	2	27	13	22	92
LAN Server-8 Users	-	92	-	-	-	-	92
Work Stations	81	360	33	211	35	25	745
Laser Printer MD	27	120	10	58	15	-	230
UPS 5 KVA	27	-	4	22	2	2	57
UPS 3 KVA	-	120	11	26	13	2	172
Total	27	120	15	48	15	4	229
Modem High Speed	54	-	21	34	6	-	115
Modem Medium Speed	27	120	2	43	13	25	230
Router	26	-	-	4	-	-	30
Air Conditioner (AC)	108	120	17	90	18	25	378

Note:

Work station	:	Pentium - 60 MH_z 540 MB Hard disk
Laser Printer	:	HP 4M+ model
Modem	:	HS (High Speed , 28.8 Kbps) and
		MS (Medium Speed, 14.4 Kbps)
UPS	:	5KVA,1 hr back-up
AC	:	1.5 ton window AC

5. CONCLUSION

From the above study it is clear that ARIS will be a major information network in India. It will play vital role in the development of agriculture in India. With close cooperation with AGRIS, CARIS and SAIC, it can extend its activities to international level. By using information from the Biotechnologies information systems (Bioinformatics), the agricultural scientists, technologists and research scholars of India can make changes in the agricultural scenario of the country.

6. SUGGESTIONS

1. ARIS Cells should be installed in all institutions related to agriculture.
2. Connectivity of these institutes shall be made at the earliest so that scientists, technical and research scholar can make use of the information available.
3. All zonal institutes should also be included in the system.
4. All the Agricultural colleges should be invariably in cluded in the network.
5. All the regional stations of ICAR institutes may be in cluded in the network.

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6

Information Services in Osmania University Library : A Survey

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ABSTRACT

Here is an assessment of the effectiveness of information services in the library, through a survey conducted during January 2001 with randomly selected undergraduate and postgraduate students as sample. The survey identified a new concept of library service, initiated in the library called Competitive Examinations Reference Library (CERL). The significant findings in this study are that majority of the students are not using periodicals. Only about a quarter expressed that the library was 'sufficient for most of their requirements', and most of the students suggested improvement of the Library.

1. INTRODUCTION

The library being a central facility of the university, the name, fame and image of the university is supported by its library. The university library vigorously and continuously supports the teaching and research and endeavours for its prosperity.

A library is an important agency charged with the function of acquisition, organisation and dissemination of information. A library supplements and complements the class room teaching. The real discoveries are made in libraries while going through books and the ideas are tested later in the field and laboratory. Toyanbee and Huxley mentioned that the university libraries in any country are used by the cultured and educated elite, as "the

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creative minority, and the salt of the earth" respectively. Their strengths and weaknesses depend mostly on the amount of their exposure to libraries.

1.1 Origin and Growth of Osmania University Main Library

The Osmania University Library (hereinafter referred to as the Library)was born in 1918 along with the university. Sir Akbar Hydari, a statesman of vision and one of the illustrious Prime Ministers of Hyderabad state conceived the idea of starting Osmania University (OU) with Urdu as medium of instruction. The library being an integral part of the university, it developed along with the university. In the beginning, the library occupied portions of the rented buildings, which housed the university in Abid Road. In 1919 the library was divided into two sections - the Occidental with 2,124 volumes of English books; and the Oriental with 3,313 volumes of various Indian language books.

When the university moved to the present campus site at Adikmet in 1934, the library occupied a temporary building which now houses one of the students' hostels. In 1939, when the granite structure of the arts college was completed, the library was shifted to a portion in this building. The library was again shifted to the present independent building in 1963 and was inaugurated by Dr S Radhakrishnan, the then President of India on 3rd August, 1963. The building area of the library is 62,000 square feet.

2. METHODOLOGY

It is felt that a survey of the library resources and facilities could help to achieve better organisation and restructuring of services. It would also disclose any existing gaps or drawbacks both in collection and services and would allow redesigning of the O U Library system for better performance and results. Hence, a survey was undertaken and the structured questionnaire method was used to elicit information on various aspects. In all, 125 (62.5%) undergraduate/postgraduate students responded out of 200. This data was collected for one week during January, 2001on the spot from the students when they were present and reading in the library or in the stack room in.

3. OSMANIA UNIVERSITY MAIN LIBRARY

3.1 Assumptions

The survey was conducted with the assumptions that:

(*i*) the undergraduate/postgraduate students of OU are mostly using books and they were not aware of the existence of non-book materials and its use;

(*ii*) the academic staff of university is not encouraging the students to go through the primary as well as indexing and abstracting periodicals available in the library;

(*iii*)Though the library is providing the Internet facility, most of the undergraduate/postgraduate students are not utilising the facility.

3.2 Aims and Objectives

Karl Jappers describes the university as a community of scholars and students engaged in the task of seeking truth. The concept of the library as the "heart" of a university, around which teaching and research revolve is widely accepted. The objectives of an Indian university during the pre-Independence days were different from which they are today. The aim of the British was to prepare Indians at the universities for recruitment to different civil services. The earliest universities were established in 1857 in Calcutta, Madras and Bombay. After Independence the universities were given a new purpose. The purpose of education is to help the citizens to form sound judgments, to help India for its economic and social growth. An important landmark in the history of higher education was the setting up of the University Grants Commission in 1956. This helped higher education develop on sound lines. The main objectives of the library are : (*i*) Conservation of knowledge and ideas, (*ii*) Research, and (*iii*) Extension service.

3.3 Holdings

The total holdings of the library as on 31st March, 2000 are as follows : Books 486,700; Bound volumes of periodicals 57,624; Government documents 3,949; Theses/dissertations 10,487; UN documents 11,192; Films 272; Manuscripts 6,428; Microfilms 143; Microfiche 30; and CD-ROMs 9

3.4 Acquisition

During the year 4,627 English and 2,586 non-English books were purchased for Competitive Examination Reference Library (English books – 916), University Library (English books – 1764, and non-English books- 545), and Seminar Library (English books – 1947, and non-English books – 2041). Books received as gifts are as follows: English 201; Non-English 739; Government documents 41; Theses/dissertations 855, and UN documents 78.Periodicals, magazines, etc subscribed during the year are as follows: Indian 119; foreign 75; magazines 88; newspapers 44; and CD-ROMS 1. Amongst these there 39 were non-English and 30 were received as gifts.

3.5 Staff

Library staff comprises of one chief librarian one deputy librarian, twelve library assistants, three professional assistants and 54 other staff.

3.6 Sections

At present there are 15 different sections serving the library, they are: Acquisition section, technical section, periodical section, reference section, textbooks not to be issued section, stack room section, art book section, thesis section , UN depository section (UN Documents Section), Government publication section, competitive examinations reference library section, lending section, manuscript section, Internet cell, officer/administration.

The staff pattern in the Library has not been tested under the available standards due to lack of information on the various items necessary for the purpose.

4. DATA ANALYSIS

The data was analysed to find out the results of the study. Table 1 shows the sources of information and data used.

4.1 Sources of Information

Table 1 : Sources of Information and Data Used

N = 125

Sl. No.	Information Sources	Yes	No
1.	Books	103 (82%)	22 (18%)
2.	Collected Works	47 (38%)	78 (62%)
3.	Conference Reports	20 (16%)	105 (84%)
4.	Research Reports	19 (15%)	106 (86%)
5.	Theses	7 (6%)	118 (94%)
6.	Experiment Results	19 (15%)	106 (85%)
7.	Govt. or Official Statistics	16 (13%)	109 (87%)
8.	Dictionaries or Other Reference Works	69 (55%)	56 (45%)
9.	Periodicals	69 (55%)	56 (45%)
10.	Survey Data	13 (10%)	112 (90%)
11.	Newspapers	88 (70%)	37 (30%)

Table 1 shows the sources of information and data used by the students. Of the sources used, books top the list with a tally of 82%, followed by newspapers 70%, and dictionaries/other reference works, and periodicals 55% each. The collected works come next with 38%, and conference proceedings with 16%. The research reports and experiment results were used by 15% students in each case. The government/official statistics, survey data and thesis were used by 13%, 10% and 6% students respectively. The analysis shows that the students mostly use books (*i.e.* text books, reference and other books) followed by newspapers, dictionaries, periodicals etc.

4.2 Reading of Periodicals

Table - 2 : Reading of Periodicals

Description	Yes	No	Total
Periodicals	31 (25%)	94 (75%)	125

Table 2 shows that only 25% of the students are in the habit of reading periodicals. Possibly the students are not being

encouraged by the academic staff to go through the periodicals in the libraries, where the students can get the latest information in the relevant subject areas.

Table-3 : Use of Abstracting and Indexing Periodicals

Description	Yes	No	Total
Abstracting and Indexing Periodicals	9 (7%)	116 (93%)	125

Table 3 shows that only 7% students use abstracting and indexing periodicals. From this poor percentage it may be assumed that most students have no knowledge of abstracting and indexing periodicals.

4.3 Adequacy of Library Book Stock

Table-4 : Adequacy of Library Bookstock

Description	Meets all requr.	Meets most requr.	Meets some requr.	Meets few requr.	Don't know	Total
Information Source Book Stock	11 (9%)	33 (26%)	51 (41%)	15 (12%)	15 (12%)	125

Table 4 reflects that the library book stock met all requirements of 9%, most requirements of 26%, and some requirements 41% students. Thus, it may be said that the requirements of majority of the students are met to a certain extent. However, there is great scope for improvement.

4.4 Rating of Services

Table-5 : Rating of Services

S. No.	Services	Yes	No	Total
1.	Borrowing Books	74 (59%)	51 (41%)	125
2.	Borrowing Periodicals	21 (17%)	104 (83%)	125
3.	Consulting Library Stock in Library for Reference/Inf.	55 (44%)	70 (56%)	125
4.	Use of Inter-Library Loan Serv	1 (1%)	124 (99%)	125
5.	Reservation of Books	19 (15%)	106 (85%)	125

6.	Provision of Photocopies	25 (20%)	100 (88%)	125
7.	Information on Location Of Books In Other Libraries	15 (12%)	110 (88%)	125
8.	Access to Commercially Produced Information Services	5 (4%)	120 (96%)	125
9.	Others	1 (1%)	124 (99%)	125

Table 5 indicates rating of library services by students. Borrowing of books exhibited the highest percentage, *i.e.* 59%, followed by consulting of library stock for reference/information (44%), provision of photocopies (20%), borrowing periodicals (17%). Reservation of books, information on location of books in other libraries, access to commercially produced information services accounted for 15%, 12% and 4% respectively. The present survey shows that the students give priority in borrowing books and consulting library stock for reference/information.

4.5 Computerisation of the Library Services

The library is nodal point on the INFLIBNET, a UGC supported network. The data entry of books, periodicals, theses and dissertations has been completed at the main library and campus college libraries. LAN has been installed within the library. Since the basic infrastructure is ready, proposals have been made to the authorities for the purchase of suitable software to start the automation services.

4.6 CD-ROMS

The library provides abstracting and indexing services through 9 CD-ROMs. These are Econlit, International Political Sciences Abstracts, BHI Plus, Psyclit , Eric, LISA plus, Child Abuse Neglect 8. Social Science Index, and Supreme Court Cases Finder 2000.

Table-6 : Knowledge of Computers

Description	Yes	No	Total
Knowledge of Computers	79 (63%)	46 (37%)	125

Table 6 shows that 63% are having computer knowledge and literacy. The remaining students expressed interest for the computer literacy.

4.7. Internet facility

Library is providing Internet facility to university faculty and research scholars. At a time 10 persons can use Internet facility. The cell started functioning from 17th April, 2000.

The charges prescribed for using the Internet cell are as follows: Registration fee (non-refundable) 100/-; Internet access/browsing 15/- (per hour); Printing charges per page 5/- (A4 size); E-mail sending 10/-;E-mail receiving 5/-.

Table-7 : Use of Internet Facility

Daily Usage of Internet Facility	
P.G. students	25
Research scholars	5
Faculty	5
M. Phil students	2
Non-teaching staff	1
Technical staff	1

Table 7 shows that PG students are the maximum users of Internet facility followed by research scholars and faculty members.

Table 8 : Time spent on Internet

Description	Not Spending	Less than 1 hr.	Less than 2 hr.	Less than 3 hr.	Less than 4 hr.	Less than 5 hr.	Total
Time spent on Internet	75 60%	24 19%	16 13%	4 3%	4 3%	2 2%	125

Table 8 shows that only 40% of the students of university use Internet facility. Nineteen per cent students use the facility for less than 1 hour, 13% students between 1 to 2 hours, 3% students between 2 to 3 hours and another 3% between 3 to 4 hours. Only 2% students use the facility between 4 to 5 hours. Frequent power cuts in the library are also responsible for the poor use of this facility by the students.

4.8 Computerised Information Network

Table-9 : Establishing a Computerised information Network linking the University Library with Department libraries

Description	Yes	No	Total
Establishing network linking of university library with dept. libraries	56 (45%)	69 (55%)	125

Table 9 mirrors the opinion of students for establishing a computerised information network linking the university library with departmental libraries. It was found that 81% students were in favour of the idea. The main library should go ahead with the networking of the library with the departmental libraries.

4.9 Creating Databanks

Table-10 : Creating databanks

Description	Yes	No	Total
Establishing databanks	93 (74%)	32 (26%)	125

Table 10 shows that 74% students were in favour of creating databanks within the students of university. The main university library should take necessary steps towards the creation of databanks.

4.10 Networking of Libraries in Hyderabad

Table-11 : Establishing Links with other Libraries in Hyderabad

Description	Yes	No	Total
Establishing links with other major libraries in Hyderabad	103 (82%)	22 (18%)	125

Here the students were asked about the need for 'Establishing links with other major libraries in Hyderabad'. In all, 82% of the students were in favour of the networking of the libraries in Hyderabad with Osmania University main library. It will be highly useful in case the library should establishes links with other major libraries in Hyderabad.

5. CONCLUSIONS

- The present survey highlights the best library practices of O.U. library through Competitive Examination Reference Library followed by Seminar Library and the introduction of Internet facility in the library.
- It is found that the students of O.U. are more dependent on the textbooks and reference books as main sources of information. It is also noted that the academic staff of the O.U. is not encouraging the students to use regular as well as abstracting and indexing periodicals. Surprisingly, only 9% of the students felt that the O.U. library is "Sufficient for all Requirements". Of the students surveyed, 59% borrowed books, 44% consulted library staff, and 17% borrowed periodicals. only. There is vast scope for improvement in all these areas.
- Further, the survey shows that about 63% students are having computer knowledge/literacy and 45% of them are using the Internet facility in the Library. Most students of this university are in favour of establishing computerised information networks, linking the university library with the department libraries as well as with other major libraries in Hyderabad.

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7

Accessing the Web for Reference Services

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ABSTRACT

Internet has now emerged as a vital tool for accessing a variety of information resources. These are unconventional sources generally having no printed counterpart. They are helpful to a reference librarian who is asked regularly to provide information to a large number of queries. This article discusses the broad resources and facilities available on the Web and describes how to make use of the search engines effectively.

1. INTRODUCTION

Internet is especially a suitable medium for accessing, selecting and using reference resources. Web contains a variety of resources *viz.* online catalogues, databases, dictionaries, encyclopaedias, biographical data, news, directories, latest announcements of books, and so on. Though Web users can obtain answers timely, quickly, conveniently and directly to a large number of queries, the overwhelming majority of the reference sources on the Web have no printed counterparts. The richness and variety of Internet sites have turned thousands of Web pages into potential reference sources[1]. With practice, knowledge and experience, librarians can make optimum use of the electronic collections. This in turn would augment the resources available at their command, practically at no additional cost.

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2. INFORMATION OVERLOAD

Internet, fueled by the phenomenal popularity of the World Wide Web (WWW), has shown a steep exponential growth over the past few years. It has grown from merely a communicating route primarily for scientists and engineers, to an essential information-exchanging vehicle for virtually everybody. All kinds of information including documents, monographs, newspapers, reports, scientific data, advertisements, video clippings, audio recordings and transcripts of interactive conversations are available. In this context, it may be added that the Internet which in its present form includes multimedia resources, was not initially perceived to support the existing organised publications. However, its popularity and easy accessibility appear to have threatened the conventional publishing industry. Virtually instantaneous and almost cost-free publications have led to a serious problem of information overload. For instance, self-publishing in the Web alone, is generating about 50-120 million pages. As per another estimate, Internet comprises more than 800 million pages.

Another major reason for information overload is that the Web does play the dual role of being a private as well as a public information and communication medium. Thus, it has now become a chaotic repository[2] which includes useful information but is largely diluted because of the background noise. Therefore, one has to be cautious in accepting and using a particular piece of information particularly in research environment. Further, it is very much required to grasp the art of obtaining comprehensive and relevant information. Let us review the resources and the facilities on Internet, described as under:

3. INTERACTIVE INFORMATION MODE

Broadly, the information resources and facilities available in the Internet can be grouped in the under-mentioned categories:

3.1. News

Several newspapers including leading and popular ones, have been made available on the Web. They can be accessed with the subject, title, date, language, name of the author, etc. and if required, the same can be downloaded. Similarly, many newsletters of societies, associations, private and public sector

industries, educational and scientific institutions, etc. have also been hosted.

3.2. Business

Statistical data dealing with the financial performance and other related areas of companies, industries, etc. are exhaustively covered on the Web. Instantaneous accessing of the stock exchanges can be helpful in knowing the spot transactions taking place. Web is another potential source for job hunters. Interested candidates can easily create and share their professional resume online. They can also develop their profiles emphasising their subject specialisation so that information relating to relevant job vacancies can be passed on directly to them through e-mail. Similarly, e-commerce has emerged on to the scene and it appears that it is replacing the conventional commercial trading in several areas.

3.3. Government Publications

White House, GPO, FBI, and other federal agencies have their individual websites offering the latest information about their activities. Many sites provide instantaneous access to such important publications as the Congressional Records, Congressional Hearings, US Census Information, or specialised collections. With other countries coming forward to host their Websites, Internet is fast becoming a real hub of information providing tool.

3.4. Cultural Information

Internet is also a good source for sharing video graphics, television based productions including bestsellers, popular music, etc. They can also be downloaded for future use, if required. In addition, it contains an ocean of information practically on every aspect of culture from all over the world.

3.5. Medical Advice

Persons seeking specialized information on medical or psychological ailments, can be benefited from the Web, quite effectively and in this way, timely preventive actions can be taken.

3.6. Internet Data

Specific information concerning Internet statistics, list of Internet access providers, e-mail facility, how to make searches on the Web, site registry and domain names, etc. can be easily obtained. In addition, tutorials for specific purposes have also been developed and made available to impart the required skills.

3.7. Directory type Information

Names, addresses, telephone numbers, e-mail addresses and other directory type information of different societies, associations, educational institutions, business houses, and the government departments, scattered the world over can be found on the Web. Small biographical sketches of important persons can also be obtained.

3.8. Travel Information

Details of many airlines (such as the fare structure, availability of seats, flight timings, etc.), hotel chains, and travel agencies are available. Users can take a virtual holiday to many cities scattered in different parts of the world, and watch pictures and other available facilities. If required, they can also obtain their quoted price. With the use of credit cards, prices can easily be negotiated and bookings are accomplished.

3.9.1Content - Journals

Content pages of certain journals are available which can be downloaded. If any specific article is of use, the same can be obtained from some other participating library. In this way, a better quality service can be achieved without incurring any additional expenditure.

3.9.2Full Text Journals

Similarly, full text of a few journal titles is also made available, which can be effective in providing enhanced quality services, by cutting down the cost.

4. SEARCH MECHANISM

Broadly, there are two methods of making the searches. The first one uses the subject index directories; and the other one employs an active involvement of a search engine. Their brief details are given below:

4.1. Subject Index Directories

Broadly speaking, any website that comprises several pages of organised links can be considered a Web directory[3]. Index is created from the collected files *e.g.* titles, full text, keywords, URL, etc.

Search services such as Yahoo, Lycos, and Excite also include directory searching through which relevant hyper links are identified. Sites are generally grouped according to broad subject areas such as business, entertainment, sports, etc[4]. Such usage is transitory in nature as after a website is located; the searching is to be made on it. This method is preferred when the topic is not very specific and only a generalised information is expected. This method was found quite effective in the initial phases of Internet, as the number of websites was limited. However, with the expansion of the sites, search engines are employed.

4.2. Search Engines

Whenever subject organised home pages are inadequate in providing relevant information, and there is a further necessity to retrieve more specific and exhaustive information, search engines are employed. Popular search engines operating on Internet are Google, Infoseek, and AltaVista. Search engines are in fact automated computer programs that search the Web and compile a list of the relevant sites based on the keywords. Depending upon the configuration of the search engine, retrieval always results in identifying the websites and may also include Usenet discussion groups, gopher, and/or FTP sites. There are two types of search engines, described as under:

4.2.1 First Generation Search Engines

Some search engines match the search query terms with the keywords supplied by the publisher of the website. In some instances, keywords and the title page words are matched. The drawback of this category of the engines is that the semantic combination of the words is ignored, and thus it results in retrieving a large amount of irrelevant documents. Similarly, searchable terms have not been standardised, with the result that all the possible synonyms have to be used if a comprehensive picture is to be obtained. Further, these engines were developed in the initial phases and, therefore, are called the first generation

search engines. An illustration of the first generation search engines is:

AltaVista, Exite, HotBot, Infoseek, MetaCrawler

4.2.2 Second Generation Search Engines

The context of usage of the searchable terms was welldefined (semantic), and thus resulted in improving the efficiency of the retrieved documents. Some other criteria were also taken into consideration in constructing logical grounds of searching. For instance, searching the full text of the Web pages is quite useful in knowing as to how many times a specific group of terms appear in the text. Based on this, analysis can be made and search results can easily be ranked. Other criteria for constructing a search engine could include search terms appearing early in the document; search terms appearing in close proximity, etc. Such search engines are called second generation search engines. Few examples are:

Google, DiretHit, InferenceFind, MetaFind, NorthernLight, ProFusion

Of late, Meta search engines enabling a user to search simultaneously across several search engines and Web directories, have been developed and made popular. Thus, Dogpile (www.dogpile.com) searches 14 different engines simultaneously, but does not eliminate duplicates. On the other hand, Mamma (www.mamma.com) searches 7 engines at a time and also removes duplicates. It also rearranges the search results according to its own relevance-ranking algorithm[5].

Another specialised second-generation search engine was developed primarily to search from the daily newspapers. Since there are thousands of newspapers hosted on Internet, it is desired to have such an engine. DejaNews (www.dejanews.com) is one such search engine having a directory of selected newsgroups which users can search. Searching by author, title, language, date, etc. is possible. Another search engine accessed as www.reference.com provides all the search facilities available in Deja News and in addition notifies the items of importance, to users through e-mail[5].

The quality and the speed of search operation vary from one engine to another. It is strongly advised to be flexible while choosing the search engine. Thus, if the required information is

not available through one engine, it could be tried with the aid of another one. In this context, it is observed that the search operation timings vary from one engine to another. The time taken by a search is affected due to the existing traffic on the Internet, complexity of the search query, and the ability of the search engine protocols to search quickly.

However, there are certain inherent limitations of the search engines. They are described as under:

- Search engines do not index all the documents available on Web. Thus, if a website is available against payment, the access to the same can be denied.
- If a site has been configured alone in the server, it may not be included in the search operation.
- If some pages in a site are not properly linked to other pages, they can be missed.
- As it takes time for a website to get it updated, it may not be possible to retrieve the most recent news.

5. VIRTUAL REFERENCE RESOURCES

In order to promote Web-based sources for reference work, librarians, have to expand their role to include familiarity with the Internet sites for reference purposes. As the electronic resources are becoming vital, useful, and easily accessible, librarians have to tap them to augment their resources. Thus, they should preserve the site information so identified during the course of their search operations, for future references. It would be preferred to retain them in electronic form. Further, these preserved materials have to be updated regularly or deleted if it has gone obsolete. In any case, the authenticity of the information retrieved from the Web has to be taken into consideration before the same is allowed to be passed on to the user.

6. CONCLUSION

Search engines in particular and Internet in general, have been evolved out of sheer necessity of searching the vast resources available on the Web efficiently so that relevant and quite comprehensive information is made available in the least possible time. Since many of the information sources on the Web are

different than the same available in the print media, the librarian is able to provide a variety of added information from the Web. In this way, Internet and Web have become the backbone of the reference system and their use is increasing.

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8

Newspaper Clipping Services in Digital World

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ABSTRACT

Six years ago, on 15 August 1995, the Internet connections for public in India were launched by the Videsh Sanchar Nigam Limited (VSNL). Today, the Internet has made it possible to access a wide array of sources of information, which were not easily available earlier. Virtually, all national newspapers and a majority of regional and even local newspapers are now represented on the World Wide Web. This study identifies a few important newspaper related information sources and services associated with the Internet. The number of newspapers accessible on the World Wide Web has grown from 20 in 1995 to over 8000 in early 2001 (140 of which are from India). Most of the online newspapers are free, interactive and archival in nature. This paper describes various advantages and disadvantages of a formal newspaper and compares it with Internet-based newspaper. It lists various Indian newspapers available on the Web recommends a few sites providing comprehensive news coverage.

1. INTRODUCTION

Newspapers have traditionally played important role in the society as both public educators and 'watchdogs'. As educators, they provide people with the information needed to make informed decisions. As watchdogs, they provide a check on government, holding public officials responsible for their actions besides other unethical, unsocial and inhuman activities in the society in general. Traditionally, newspapers have been able to play these roles

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because they deliver the same news to all members of a community. By browsing through the paper, people who would not normally seek certain types of news tend to be exposed to it anyway. The other advantages of newspaper are:

- Traditional medium, credibility
- Good for detailed messages
- Demographic targeting
- Extensive penetration
- Flexibility
- Reader involvement and acceptance
- Pass along readership
- Special services
- Geographic selectivity
- Portability
- Variety
- Indexed content
- Depth coverage
- User selectable rate and content
- Offer wide range of information

2. NEWSPAPER CLIPPING SERVICE

The need for quick, reliable, and comprehensive access to the information published in newspapers has long been recognised. Newspapers provide access to the most current information, which include news reports, editorials, letters to the editor, product evaluations, biographical information, financial information, etc. A newspaper clipping service (NCS) is one such solution. The objectives of a typical NCS are: (*i*) to enable scientists and decision makers identify problem areas where investigations are to be initiated; (*ii*) to disseminate information on prominent issues of current value in the field which may not be available in books and periodicals; (*iii*) to identify new areas where research activities can be undertaken; (*iv*) to track the competitors; and (*v*) to avoid duplication of research by updating archives. Top managers in general have very little time and too much to read; they are often best served by NCS. Junior and middle management also may use

NCS for getting new ideas and for information on new opportunities and competitors' activity. The NCS is thus one of the best channels to keep the users well informed and up-to-dated about the current events.

In a typical NCS, all the subscribed newspapers are scanned for selecting items of their field of interest. The relevant items are marked and all marked items are cut. In cases, where many newspapers cover the same news item, the item with the maximum news is included. All relevant editorials and review articles are also included. Some of these items are enlarged or reduced while xeroxing to fit in A4 size sheets and are arranged by a specified subject order. At the bottom of each item, the source (newspaper name) and date is stamped. Daily clippings are bound and given a unique serial number. Photocopies of the original set are mailed to the various users on the same day. These bound sets are arranged in chronological order and preserved for archival purposes. These items can also be put on local area network for wider use. The NCS is thus an updated supplement to other reference sources and is an integral part of any research-oriented organisation/institution.

However, newspaper clippings have a limited lifetime. The acidity of ground wood paper has a decisive factors of its lifetime. Slightly acidic or neutral modern newsprints loose their strength very slowly due to accelerated aging; very acidic historic newsprints, however, are already in a higher stage of degradation and lose their strength intensively after a certain time of accelerated ageing. Deacidification treatment considerably slows down the loss of strength in these papers; but, despite the elimination of acidity, intensive deterioration affecting mechanical properties of paper takes place with time. Research investigations into this phenomenon suggest that besides acid hydrolysis, thermo-oxidation reactions on cellulose and lignin as well as decomposition reactions of lignin in the newly created alkaline medium cause intense deterioration of the paper strength during accelerated ageing.

The three ways of preserving newspaper clippings are: microfilming, de-acidification and alkaline buffering, and polyester film encapsulation. If the information on a clipping rather than the clipping itself is required, the clipping can be photocopied on an acid-free bond paper and preserved. Future perspectives in this regard focus on CD-ROM and Internet as the favoured storage media.

3. INTERNET-BASED NEWSPAPERS

Apart from the short lifespan of newspapers, the following disadvantages of printed newspapers were being felt for many years:

- Poor reproduction
- Lack of selectivity
- Clutter
- Passive medium
- Limited readership

To overcome these disadvantages, the newspapers are gradually being supplemented by their sites at Internet also. In this Information age, people are continually bombarded with facts and figures, news and analysis and messages and memos. Information overload is an unavoidable fact of life for busy people today. Newspapers are widely available on the Internet. They are virtually free; their income comes from providing advertisers an access to their users. Newspaper websites foster invisible colleges.

The first paperless electronic newspapers were developed in the late seventies. Early commercial electronic newspapers, including Times Mirror's Gateway and Knight-Ridder's Viewtron were marketed towards home consumers. However, these electronic newspapers, which simply scrolled selected news stories across subscribers' computer monitors or television screens, were not commercially successful.

4. ADVANTAGES OF INTERNET-BASED NEWSPAPERS

The various advantages of Internet-based newspapers are:

- Timeliness
- Searchability
- Information storage
- Space availability
- Archive facilities
- Currency
- Customisation
- Interactivity
- Multimedia
- Catering to wider audience

- Ease of navigation
- Use is normally free of charge
- Use of a wider spectrum of newspapers possible
- Use of links
- Automated searching
- Use of foreign newspapers
- Contact with editors via e-mail
- Use of guest book/forum
- Multiple searches may be entered
- Results can be downloaded into Reference Manager or EndNote
- Search will be run automatically whenever database is updated
- Search will be delivered to an e-mail box of your choice
- Search parameters include subjects, authors, journal titles and addresses
- Documents can be requested electronically

Internet-based newspapers are also likely to have environmental impacts. Tons of newsprint is presently being consumed in the world. Internet-based newspapers would drastically reduce the amount of newsprint consumed. Paper consumption would be reduced even if the newspaper subscribers choose to print their newspapers on their own printers as the people are likely to print much less news than is contained in most printed newspapers.

5. MAJOR NEWSPAPER-BASED SERVICES ON INTERNET

The standard workflow of an electronic clipping archive is being organised in a similar way and will consist of the following steps: scanning, clipping, pasting, prime and bibliographic indexing, filing, content indexing, and final storing. Newspaper-based services on Internet keep the users continually informed about new developments in their fields of interest through continuous updation of their websites and by way of citations sent to the individual's e-mail account. Some of the major Internet sites providing such information services are:

5.1 Bell & Howell Information & Learning (UMI) (http://www.umi.com/proquest)

It offers access to the remote full text databases of sufficient size and

scope to be useful to the serious researchers. It has a content base of over 17,000 periodicals, 7,000 newspapers, and 1. 4 million dissertations. Remote access includes Z39.50 and LYNX browsers.

5.2 CyberScan Clipping Services (http://www.clippingservice.com/index.html)

CyberScan targets communications professionals and tracks issues, products, public opinion, and other information on the Web. Three key services offered are: WebScan, Opinion Monitoring, and Site Tracking. WebScan and Opinion Monitoring services are similar to traditional news and information clipping services that cover newspapers, magazines, and other print publications. WebScan, on the other hand, covers millions of Web sites, including approximately 1,500 Web-based news sources.

5.3 Entrypoint (http://www.entrypoint.com)

Entrypoint is a news network that appears instantly on one's computer screen. It broadcasts national and international news, stock information, industry updates, weather, sports scores, etc. from sources like CNN, CNNfn, Time, People and Money Magazines, Reuters, PR Newswire, BusinessWire, and more. However, one must download and install their special software to use this service.

5.4 Individual.com (http://www.individual.com)

On this site one can create one's own free personal news page or sign up for daily e-mail briefing of events. One can also search through the last five days worth of news. Its Headline Feed program automatically places headlines about relevant topics, updated every business morning, on one's personal website.

5.5 Laurin (http://www.laurin.com)

The LAURIN Project, with 18 partners in 7 European countries, provides newspaper-clipping archives with digital technology and allows the users an online access to the resulting collections. LAURIN is coordinated by the Innsbruck University. The LAURIN clipping software and the local node software need to be installed and validated at the participating libraries and archives. A first prototype of the LAURIN OPAC is available on the Internet. The EU LAURIN project aims to digitise newspaper archives and make them available in a network, accessed via a library, and to find

standardised systems for digitisation, IT systems, and copyright. The end product will be a full-text database of the partners' archives.

5.6 NewsHound (http://www.newshound.com)

NewsHound is a fee-based, personalised news agent of the San Jose Mercury News to scan Knight-Ridder newspaper content and presswires and deliver clips on up to five topics into the user's mailbox.

5.7 Newsinform (http://foreignmedia.com)

News Express has demonstrated Newsinform, which delivers complete full text international newspapers to the user's computer on the day of publication or, in some cases, the day before the paper is released in the country of its publication. Over 40 newspapers are delivered via the Web in PDF format that is identical to their print editions on news stands. Every article, graphic, and advertisement is included in its original layout. These newspapers are available from five continents in Arabic, Czech, English, French, German, Farsi, Portuguese, Russian, and Spanish.

5.8 Newslinx (http://www.newslinx.com)

Newslinx provides access to several full-length articles daily, with frequent updates, from a variety of sources, including major newspapers. The users select from headlines, arranged in no particular order. While there are some archives by news topics and listings of daily headlines dating back to 1996, that can be quite useful, many of the newspaper article links are simply not active beyond the first day.

5.9 NewsPage (http://www.newspage.com)

NewsPage service of NewsEdge Corporation is primarily a current awareness service that also has limited archives. It scans 600 publications and news services to identify the key articles each day in almost 100 predefined categories, at least a dozen of which are Internet related. Users easily compose profiles of their interests and receive a compilation of the top 20 stories in their profile.

5.10 News Search (http://www.newspage.com)

Excite provides three comprehensive search indexes to help the users find the needed news stories and photos. After entering

query in the search box, the user can simply select news index: (*i*) News indexes; wherein Web news, refreshed four times a day, provides headlines from over 350 websites, including ABCNews, Boston Globe, CNN Interactive, E! Online and Popular Science, (*ii*) Newswires, updated every hour, collects breaking stories and photos from wire services like Associated Press, Reuters, SportsTicker, Business Wire and Dow Jones, and (*iii*) News Photos, updated every hour, contains more than 20,000 of the latest news photos from Reuters and Associated Press.

5.11 Powerize (http://www.powerize.com)

Powerize, formerly KnowledgeLink Interactive, is an Internet-based distributor of business information. It now offers unlimited online access to the full text of over 2,400 newspapers, magazines and other publications mostly through arrangements with Bell & Howell Information & Learning, formerly UMI.

5.12 TotalNEWS (http://totalnews.com)

TotalNEWS is an Internet directory, listing over 1,200 online news sites and provides keyword-in-context searching.

6. ALTERNATIVE DELIVERY

Some newspapers have established alternative ways for the people to access their news. The San Jose Mercury News (http://www.sjmercury.com) has a service called Mercury Mail that allows readers to receive daily summaries on one or more topics via e-mail free of charge.The New York Times (http://www.nytimes.com) has an eight-page fax version, TimesFax that can be seen on its website. One of the recent local delivery methods is push technology, wherein channels of news are directly delivered to computer screens. PointCast (http://www.pointcast.com), a leading push provider, incorporates feeds from several newspapers, including those of Knight-Ridder, Times Mirror, and Advance Publications. Some Internet-based newspapers include audio coverage. Many newspaper companies own broadcast properties and thus provide access to audio coverage or video clips.

7. IMPORTANT NEWSPAPER-LINK SITES

Some other important sites having links to various newspapers (which can be used as source for NPC services) are:

- ABC NewsRad.o (http://www.abcnet.au/newsradio)
- Abyz News Links (http://www.abyznewslinks.com)
- CyberAlert (http://www.cyberalert.com)
- Elibrarytracker (http://www.elibrarytracker.com)
- Gale Group (http://www.galegroup.com)
- India Informer - News (http://www.Indiafocus.indiainfo.com/media/newspapers)
- Ixquick (http://www.ixquick.com)
- Moreover News Story Search (http://w.moreover.com)
- My Virtual Newspaper (http://www.refdesk.com/paper.html)
- NetCurrents (http://www.netcurrents.com/report/sample.html.)
- News.com (http://news.com)
- News Directory (http://www.newsdirectory.com)
- NewsTracker (http://nt.excite.com)
- Newspaper Galore (http://www.wcow.com/html/news_world.html)
- Newspaper index (http://www.concentric.net/~stevewt/)
- News2me (http://www.interdomain.net.au/~amj/news2me)
- Online Newspapers (http://www.onlinenewspapers.com)
- Principal Newspapers (http://www.geocities.com/~oberoi/newspaper.html)
- Rediff (http://www.rediff.com)
- The Paperboy (http://www.thepaperboy.com)
- Web Translator (http://world.altavista.com)
- World Newspaper Links (http://www.kidon.com/media_link/index.shtml)
- World newspapers (http://worldnewspapers.about.com)
- Yahoo! (http://www.yahoo.com)

8. DISADVANTAGES OF INTERNET-BASED NEWSPAPER CLIPPING SERVICES

Some of the disadvantages of internet-based newspaper clipping

services are:

- Online newspapers do not report on all subjects
- They do not convey the experience of reading a newspaper
- Long download times
- Online newspapers cannot be read while traveling, in most cases
- Reading the screen is tiring
- Internet access costs
- Too many links are confusing rather than helpful
- It takes time to get used to using them
- In many cases searches must be run manually
- Results cannot always be limited to most recent update

9. CONCLUSION

Virtually all national newspapers and the vast majority of regional and even local titles are now represented on the Web. Broadcasters and news agencies also boast of comprehensive Internet services. With such an array of sources available, the future of mass access to the Internet, possibly via TV terminals, suggests that more and more people may soon opt for this medium to receive the bulk of their news. However, the Web-based newspaper clipping services are presently affected by copyright law in two respects: (*i*) the digitisation of newspaper articles and (*ii*) the making available of these articles to the public via an electronic network. Once a solution in this regard is available, the internet-based news services will become very popular and effective in their purpose.

The new information and communication technologies have been described in literature as both an opportunity and a risk from the point of view of the traditional established media. As a form of computer-aided communication, the Internet is equally ambivalent for the print media. Its technical potential greatly surpasses that of the printed newspapers in a number of ways. On one hand, Internet presents a threat to the traditional distribution system of the newspapers; on the other hand, it gives publishing houses the opportunity to offer up-to-date information, advertisements and additional services via an effective communication channel.

Reaching more readers is the most important reason for going online. Yet newspaper publishers have not been successful in getting online readership information. Since online subscriptions have not materialised yet, Internet publishing is currently dependent on revenues brought in by advertising and Internet-related services. Charging for archives may be the next potential income source. The newspaper industry, nevertheless, remains optimistic about the future of both the print and the Internet-based newspapers. But as on today, most of the Indian institutions still maintain their paper-based clipping collection, and they will continue to do so in the near future.

Annexure 1

INDIAN NEWSPAPERS ONLINE

Aaraamthinai (Tamil)	http://www.aaraamthinai.com/
Afternoon Dispatch & Courier (Eng)	http://www.cybernoon.com/
Akila Daily (Gujarati)	http://www.akiladaily.com/
Amar Ujala (Hindi)	http://www.amarujala.com/
Ambalam (Tamil)	http://www.ambalam.com/
Anandabazar Patrika (B'gali)	http://www.anandabazarpatrika.co
Ananda Vikatan(Tamil)	http://www.vikatan.com/
Anantha Vikatan (Tamil)	http://www.ananthavikatan.com/
Andhra Bhoomi (Telugu)	www.andhrabhoomionline.com/
Andhrajyoti (Telugu)	http://www.andhrajyoti.com
Andhra Prabha (Telugu)	http://www.andhraprabha.com/
Andhra Pradesh Times (Eng.)	http://www.aptimes.com/
Andhra Today (English)	http://www.andhratoday.com/
Arcade (English)	http://www.pugmarks.com/arcade
Asian Age (English)	http://www.asianage.com/
Bangalore Age (English)	http://www.bangaloreage.com/
Bharat Samachar (English)	http://www.bharatsamachar.com news.htm
Bharat Times (English)	http://www.bharattimes.com/
Bihar Times (English)	http://www.bihartimes.com/
Business Line (English)	http://www.hindubusinessline.com/

Business Standard (English)	http://www.business-standard.com/
Business Today (English)	www.india-today.com/btoday /index.html
Calcutta Online (English)	http://www.calcuttaonline.com/
Chitralekha (Gujrati)	http://www.chitralekha.com/
Choutha Sansar (Hindi)	http://www.siddhart.com/sansar/
Daily Excelsior (English)	http://www.dailyexcelsior.com/
Daily Hindi Milap (Hindi)	http://www.hindimilap.com/
Daily Thanthi (Tamil)	http://www.dailythanthi.com/
Dainik (Hindi)	http://www.dainik.com
Dainik Aikya (Marathi)	http://www.dainikaikya.com/
Dainik Bhaskar (Hindi)	http://www.bhaskar.com/
Dainik Jagran (Hindi)	http://www.jagran.com/
Dainik Kesari (Marathi)	http://www.indianlanguages.com/ kesari/
Dainik Pratidin (Bengali)	http://www.pratidin.com/
Dainik Suprovat (Bengali)	http://www.suprovat.com/
Dainik Tribune (Hindi)	http://www.tribuneindia.com/
Deccan Chronicle (English)	http://www.deccan.com/
Deccan Herald (English)	http://www.deccanherald.com/
Deepika (Malayalam)	http://www.deepika.com/
Deshabhimani Daily (M'lam)	http://www.deshabhimani.com/
Deshonnati (Marathi)	http://www.deshonnati.com/
Dharitri (Orriya)	http://www.dharitri.com/
Dinakaran (Tamil)	http://www.dinakaran.com/
Dinamalar (Tamil)	http://www.dinamalar.com/
Dinamani (Tamil)	http://www.dinamani.com/
E-pao (Manipuri)	http://www.e-pao.net.com/
Economic Times (English)	http://www.economictimes.com/
Eenadu (Telugu)	http://www.eenadu.net/
Ganashakti (English)	http://www.ganashakti.com/
Goa Herald (Goa)	http://www.indianexpress.com/goa/

Goa National News (English)	www.indiaexpress.com/goa/gomantak/
Goa Today (English)	http://www.goacom.com/goatoday/
Gomantak Times (English)	www.indianexpress.com/goa/gomantak/
Greater Kashmir (English)	http://www.greaterkashmir.com/
Gujrat Business (English)	http://www.gujrat-yellowpages.com/
Gujarat Samachar (Gujarati)	http://www.gujaratsamachar.com/
Gurjari (Gujrati)	http://www.gurjari.net/
Hindi Milap (Hindi)	http://www.hindimilap.com/
Hindu (English)	http://www.hinduonline.com/
India Daily (English)	http://www.indiadaily.com
India Express Group (English)	http://www.expressindia.com/
Indian Express (English)	http://www.expressindia.com/ie/
India World (English)	http://www.indiaworld.co.in/
Inquilab (Urdu)	http://www.Inquilab.com/
Jagran (Hindi)	http://www.jagran.com/
Kanian Tamilnews (Tamil)	http://www.kanian.com/tamilnews
Kannada Prabha (Kannada)	http://www.kannadaprabha.com/
Kashmir Times (English)	http://www.kashmirtimes.com/
Kaumudi (English)	http://www.kaumudi.com/
Kerala Daily News (English)	http://www.keral.com/daily.htm
Kerala Express (Malayalam)	http://www.keralax.com/kxp/kxp.htp
Kerala Kaumudi (Malayalam)	http://www.keralakaumudi.com/
Kranti Daily (Kannada)	http://www.krantidaily.com/
Kumudam (Tamil)	http://www.kumudam.net/
Kuyil (Tamil)	http://www.kuyil.net/ kuyil
Lashkar (Urdu/Hindi)	http://www.lashkar.com/
Lokmat Times (Marathi/Eng)	www.lokmattimes.com/today/index.html
Loksatta (Marathi)	http://www.loksatta.com/
Madhya Pradesh Chronicle (Eng)	http://www.mpchronicle.com/
Maharashtra Herald (Eng.)	www.indiaventures.com/

	maharastraherald/
Maharashtra Times (Marathi)	http://www.maharashtratimes.com/
Malayala Manorama (K'yam)	http://www.manorama.com/
Malaysia Nanban (Tamil)	http://www.murasu.com/nanban/
Mangalam (Malayalam)	http://www.mangalam.com/
Mathrubhumi (Malayalam)	http://www.mathrubhumi.com/
Mid-Day (Mumbai)	http://www.midday.chalomumbai.com/
Minnambalam (Tamil)	http://www.ambalam.com/
Minnoviam (Tamil)	http://www.minnoviam.com/
Munsif Daily (Urdu)	http://www.munsifdaily.com/
Naidunia (Hindi)	http://www.siddhart.com/sansar/
Nakkheeran (Tamil)	http://www.pcsadvt.com/nakkheeran/
Navbharat Times (Hindi)	http://www.navbharat.com/
Navhind Times (English)	http://www.goacom.com/navhind/
NilaNews (Malayalam)	http://www.nilanews.com/
Orissa Sambad (Orriya)	http://www.sambad.com/
Pragativadi (Orriya)	http://www.pragativadi.com/
Prajavani Daily (Kannada)	http://www.prajavani.net/
Pratidin (Bangali)	http://www.pratidin.com/
Pratidin Assam (Assam)	http://www.pratidinassam.com/
Pudhari (Marathi)	http://www.pudhari.com/
Pune Darshan (Marathi)	http://www.puneflash.com/
Punjab Kesari (Hindi)	http://www.tribuneindia.com/
Rajasthan Patrika (Hindi)	http://www.rajasthanpatrika.com/
Raknno (Konkanni)	http://www.raknno.com/
Ranchie Express (English)	http://www.ranchiexpress.com/
Sakal (Marathi)	http://www.esakal.com/
Sambhaav (Gujarati)	http://www.sambhaav.com/
Sambad (Bengali)	http://www.sambad.com/
Sambad (English)	http://www.vikatan.com/

Sambhaar (Gujrati)	http://www.sambhaar.com/
Sandesh (Gujarati)	http://www.sandesh.com/
Sanje Vani (Kannada)	http://www.sanjevani.com/
Sanjhsavera (Punjabi)	http://www.sanjhsavera.com/
Samjog (English)	http://www.samjog.com/
Sikh Virsa (Punjabi)	http://www.sikhvirsa.com/
South Nexus (English)	http://www.southnexus.com/
Srishti News (English)	http://www.srishtipublications.com/
Tamil Murasu (Tamil)	http://www.asia1.com.sg/tamilmuradu/
Tamil Nadu Hot News (Tamil)	http://www.tamilcinema.com/gen_news/hnews.ahtml/
Tamizh Cholai (Tamil)	http://www.indiaplus.com/cholai/index.shtml/
Taranga (Kannada)	http://www.udayavani.com/taranga/
Tarun BharatKesari (Marathi)	http://www.tarunbharat.com/
The Assam Tribune (English)	http://www.assamtribune.com/
The Financial Express (English)	http://www.expressindia.com/fe/
The Gangtok Times (English)	http://www.sikkiminfo.com/gtimes/
The Hindustan Times (English)	http://www.hindustantimes.com/
The Indian Express (English)	http://www.expressindia.com/ie/daily/
The Navhind Times (English)	http://www.goacom.com/navhind/
The New Indian Express (English)	http://www.newindpress.com/
The Pioneer (English)	http://www.the-pioneer.com
The Sentinel (Hindi/Eng)	http://www.sentinelassam.com/
The Siasat Daily (Urdu)	http://www.siasat.com/
The Statesman (English)	http://www.thestatesman.org
The Telegraph (English)	http://www.telegraphindia.com/
The Times of India (English)	http://www.timesofindia.com/
The Tribune (English)	http://www.tribuneindia.com/
The Voice of Millions (English)	http://www.thevoiceofmillions.com/
Thina (Malayalam)	http://www.thina.com/
Thinaboomi (Tamil)	http://www.thinaboomi.com/
Thina-Thanthi (Telugu)	http://www.dailythanthi.com/

Thinnai (Tamil)	http://www.thinnai.com/
Thozhilulagam (Tamil)	http://www.thozhilulagam.com/
Udayavani (Kannada)	http://www.udayavani.com/
Vaartha (Telugu)	http://www.vaartha.com/
Vanavil (Tamil)	http://www.vanavil.com/
Velugu (Telugu)	http://www.siticable.com/
Viduthalai (Tamil)	http://www.periyar.org/viduthalai/
Webdunia (Hindi)	http://www.webdunia.com/
Wow Hyderabad (Telugu)	http://www.wowhyderabad.com/
Yugantar Punjab (Punjabi)	http://www.yugantar.com/

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9

Information Needs and Seeking Behaviour of Physical Education Teachers in India

L. USHA DEVI*

ABSTRACT

The paper examines the information needs and information seeking behaviour of physical education teachers in India. Results reveal that many of these teachers perceived the need to know the latest development in their own field of specialisation and also the latest changes in rules and regulation of the games. The library has been identified as the most heavily used information source along with other sources like Radio, Television, etc., however library donot fulfil their role in meeting the information needs of physical education teachers. Recommendations are made on the basis of the findings.

1. INTRODUCTION

The concept of continuing education as we all know is relatively new in the total process of education and is of very recent origin and has originated from the belief that the traditional pattern of organised learning should not be restricted only to a few years of life, but should be a lifelong process.

Continuing education can be defined as the process which culminates at the formal stage of learning, but which can be kept going in one's field of interest either for pursuit of knowledge or for achieving professional proficiency and material gain.

In this context the need for continuing education for any person in general and physical education in particular has been recognised. Though information is important for every profession,

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there is no doubt that physical education teachers depend fully on relevant, precise and timely information for success in the profession.

2. NEED FOR THE STUDY

The determination of information needs of users is necessary to the management of an information centre as it helps in determining the appropriateness of library resources in meeting the demand of users. Information need is something not directly observable and its "structure unseen", exists in the mind of the user. Information needs are diverse, constantly changing and not amendable to generalisation. A good knowledge of information needs of library clientele is necessary to avoid misallocation of resources. Hence, the objective of this study was to determine the information needs and information seeking behaviour of physical education teachers in India who are involved in formal teaching at the postgraduate level.

3. METHODOLOGY

Since the study is on information needs and the challenges to physical education libraries, we selected physical education teachers, who by the nature of their activities, have access to libraries in colleges of physical education.

The study adopted a stratified random sampling method to select 25 physical education teachers. The samples are selected from different states of India, (out of 50 questionnaires mailed only 25 responded). Data was collected through a combination of questionnaires, interviews and personal observation. Unstructured interviews were conducted with randomly selected physical education teachers who had gathered to attend the 7th National Conference on Physical Education and Sports Sciences, February 2000, Bangalore.

4. RESULTS AND DISCUSSIONS

Out of the 50 questionnaires distributed only 50% (N-25) responded. Maharastra ranks first with seven respondents, next comes Karnataka with 6 respondents and other states occupy the third and fourth ranks with two and one respondents (Table1).

4.1 Statewise distrubution of the Samples

Table1 **N-25**

State	Number	Percentage
Andhra Pradesh	2	8%
Assam	1	4%
Gujarat	2	8%
Himachal Pradesh	2	8%
Karnataka	6	24%
Madhya Pradesh	2	8%
Maharashtra	7	28%
Tamilnadu	2	8%
Andhra Pradesh	1	4%

4.2 Study Sample Characteristics

The study sample mainly consists of physical education teachers who are involved in teaching (N-20) 80%, teachers as well as coach (N-3) 12%, teacher and also Principal *i.e.,* looking after the administration of the college (N-2) 8%, between the age group of 25-35 years (N-13), 36-46 years (N-7) and 47-57 years (N-5). Out of the total study sample 44% (N-11) come from rural areas and 56% (N-14) from urban areas of which 28% (N-7) of them possess a basic degree and degree in physical education, 36% (N-9) possess basic degree and Master's degree in physical education, 16% (N-4) possess Master's degree and Master's degree in physical education and 20% (N-5) possess two Master's degree and doctorate in physical education. Of the total sample 76% (N-19) are male and 24% (N-6) are female and 60% (N-15) are married and 40% (N-10) are unmarried. As it is clear that the study sample are physical education teachers they are directly involved in sports, and none of them have represented India at the international level. 4% (N-1) have reached the National level, 24% (N-6) District level, 24% (N-6) State Level, 16% (N-4) Inter-university level and all of them (N-25) have represented the university level and local level sports (Table 2).

Table2: Characteristics of the Study Sample

Characteristics	Number	Percentage
Designation:		
Teacher	20	80%
Teacher & Coach	03	12%
Teacher & Administrator	02	08%
Gender:		
Male	19	76%
Female	06	24%
Age:		
25 – 35 Years	13	52%
36 – 46 Years	7	28%
47 – 57 Years	5	20%
Bachelors degree & Bachelors degree in physical education	07	28%
Bachelors degree & Masters degree in physical education	09	36%
Masters degree & Masters degree in physical education & Diploma in NIS	04	16%
Masters degree & Masters degree in physical education and Ph.d.	05	20%
Habitat:		
Rural	11	44%
Urban	14	56%

Marital Status		
Married	15	60%
Unmarried	10	40%
Level of Representation in Sports:		
International	-	-
National	01	4%
District	06	24%
State	06	24%
Inter-University	04	16%
University	25	100%
Local Level	25	100%

4.3 Information Needs of Physical Education Teachers

The Information needs of physical education teachers in order to enhance their performance as teachers, were identified in this study and they are itemised for evaluation and all others are grouped under others. Respondents were requested to indicate their information needs (Table 3).

Results in Table 3 show that almost all of them (N-25) perceive the need of know the different subject area or allied subject coming up in their field and (N 7-8) expressed the need to know the latest development in their own field of specialisation and also pertaining to the syllabus they are expected to teach. As they are involved in sports activities about 40% to 64% of them (N 10-16) expressed the need to know the changes that are taking place in the rules and regulations of the games and also the different coaching centres and coaches in order to guide the students for further improvement in their respective field of interest.

Almost all the respondents (N-25) have expressed the need to know the different subject areas and for obtaining information on local and international seminars and conferences (100%).

Table 3 Information Needs of Physical Education Teachers

Rank No.	Information needs	Number	Percentage
01.	Be aware of different subject areas and their development	25	100%
02.	Obtain information on local international seminars, conferences etc., with a view to attending same	20	80%
03.	Regarding rules and regulations of the game	16	64%
04.	About sports programmes	10	40%
05.	Pertaining to the syllabus	8	32%
06.	Know the latest development in their own fields of specialization.	7	28%
07.	About coaches and coaching centres	4	16%
08.	Other	25	100%

4.4 Sources of Information for Physical Education Teachers.

The data in Table 4 suggests that no single mechanism for enabling access to information should be seen as the ultimate solutions to the information needs of physical education teachers. Rather, a complementary range of sources and solutions must be provided.

Table 4 results reveal that a highly significant majority 25 (100%) of the physical education teachers would use library collection, radio, television and newspapers and discussion with colleagues for information on a regular basis, 76% (N-19) would approach government publications such as Government Orders, Gazettes etc. They rarely accessed information through the internet or other electronic databases.

Table 4: Sources of Information for Physical Education Teachers

Characteristics	Number	Percentage
Library Collection	25	100%
Inter-personal communication with colleagues	18	72%
Government publication	19	76%
Radio	25	100%
Television	25	100%
Newspaper	25	100%
Electronic data bank/ Internet	05	20%

4.5. Extent of Using The Library

Table5 reveals that 64% (N-16) visit the library regularly 28% (N-7) often visit the library and 8% (N-2) visit the library as and when the need arises.

Table5: Extent of Using The Library

Extent	Number	Percentage
Regularly	16	64%
Irregularly	07	28%
Rarely	02	8%

4.6 Time Devoted For Physical Exercise

Table 6 reveals that 64% (N-16) devote much of their leisure time . practicing sports and physical exercises. As these teachers are involved in teaching the skills of the games, they make it a point to devote atleast one hour daily either in the morning or in the evening to physical exercises.

Table 6 : Time Devoted For Physical Exercise

Time	Number	Percentage
Morning	4	16%
Evening	5	20%
Both	16	64%

5. CONCLUSION

The respondents expressed the need for physical education and sports information. Knowing the latest development and allied subject areas were rated as main needs. This was probably to provide the latest information to their student community.

Interview with the teachers revealed that the teachers frequently had trouble in stating their information needs, particularly when pressed to specify what resources would satisfy them. They also expressed their problems with regard to languages, as most of the physical education books/publications are in foreign languages especially in English and not sufficient publications are available in Indian languages.

The library was discovered to be the most heavily consulted source. The respondents are of the opinion that the libraries in colleges of physical education are not up to their requirements and that they have to depend on other libraries (Public Libraries, University Libraries, etc.) to supplement their requirements. Electronic databases/Internet were rarely consulted, since most of them do not have access to databases. Since, physical education teachers are always in need of updating their knowledge and professional skills, it is recommended that libraries in colleges of physical education should be updated and well equipped. One of the studies already conducted by the author revealed that they are ill-equipped with lack of professional staff to manage them. Hence attention should be diverted towards the augmentation of these libraries.

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10

Knowledge Management Technologies to Disseminate Information Wealth

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ABSTRACT

Knowledge management technologies capture, store, catalogue, project, retrieve and disseminate information. It is the content that sets the data warehousing. The knowledge management should allow technology to dictate so that technology based concepts flourish and become instrumental in achieving organisational objectives. Specific goals can be achieved by knowledge sharing effectively. The information managers should strive for capturing experiences globally through technology and measure knowledge by means of creative processes.

1. GENERATING VALUES

Knowledge Management (KM) is the process through which learned institutions generate value from their intellectual and knowledge based assets. In fact it is the practice of harnessing and exploiting intellectual capabilities to gain the competitive advantage and draw researchers' commitment. It leads to efficiency, innovation and faster and more cost effective decision-making in research endeavours of the organisation. Much of the value added research is generated from such assets. It involves shared information among the scientists and the organisations and an integrated approach to new / prospective innovations through the best practice of sharing information resources. No

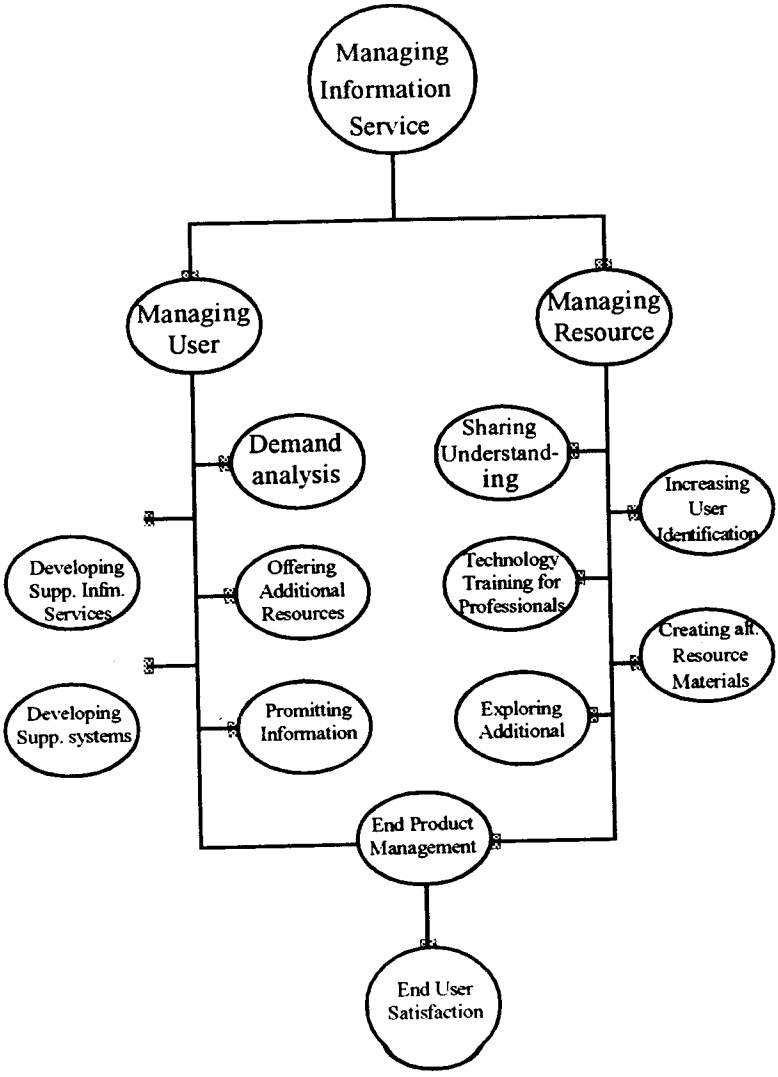
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doubt, technology often facilitates knowledge management with utmost efficacy and efficient handling of information and thus helps to reach new heights. Knowledge management technologies capture, store, catalogue, protect, retrieve and disseminate information. But it is the content that sets it one step above data warehousing.

2. KNOWLEDGE ASSETS

Not all information is valuable. Therefore, the individual librarians / information scientists have to determine what information qualifies as intellectual and knowledge based asset. In general, intellectual and knowledge based assets fall into two categories (a) Explicit assets (b) Tacit assets. Patents, trade marks, business plans, scientific and market research and information user communities constitute 'explicit information assets'. The explicit knowledge can be documented, archived and codified and it often helps the information technology. The tacit knowledge has to be grasped from the people's heads *i.e.* the hyper knowledge. The challenge inherent with tacit knowledge is difficult to recognise, generate and share and manage physically. The difficulty with the information centres is relating to e-mail, groupware, instant messaging and related technologies. These can facilitate the dissemination of tacit knowledge. This is the major hurdle to harness the information in all research and higher education organisations. The real value of intellectual capital is in the heads of knowledge workers—their skills, experiences, hard-won insights and intuition and the trust they have invested and earned in relationships inside and outside the research and higher education organisations. It is in fact, difficult to evaluate such knowledge and bank on its sharing and leverage. To say further, knowledge worker is an asset to the organisation, whereas knowledge is a depreciating asset – eg. patents which lose their value if not utilised.

Strategic Information Supply Management



3. THE BENEFITS

The benefits of knowledge management are manifold. In today's information driven economy, the organisations have to tap the most opportunities and derive the most value from intellectuals rather than from physical assets. To get the most value from the organisation's assets, knowledge must be shared since it serves as the foundation for collaboration.

Knowledge management should :

- Foster innovation by encouraging the free flow of ideas and thoughts
- Improve user service by streamlining response time of information generated at the library
- Generate resources by getting new products and services to foster the users demand for creditable information
- Recognise the resourceful research investigators and reward them with enhanced knowledge supply and value their queries for additional and valuable information
- Streamline service operations and reduce costs by eliminating redundant or unnecessary processes.

A creative approach to knowledge management would result in improved efficiency, higher productivity and increased resource mobilisation in any organisation.

4. THE CHALLENGES

Knowledge management becomes essential as the organisations tend to ignore information personnel very much. When the tasks become difficult, the managers realise the gravity of issues and crave for the resource generation to tide over the crises. In any given situation, the information scientists' potential portals are to be identified and rewarded suitably.

The recognition ingredients being:-

- Individuals knowledge should be valued and rewarded
- Establish and recognize tacit knowledge and encourage potentiality critically
- The concept of knowledge management should be estimated appropriately

- Intellectuals' knowledge and experience and their traits be evaluated appropriately and supported effectively
- Motivate information managers to participate in knowledge management
- Quality and relevance of information be given due weightage and prompted for further information contribution
- Participation in knowledge management be aptly rewarded to make the information flow easily for all intellectuals and information seekers
- Knowledge management is not a technology based concept but organisations should implement a centralised database system, electronic message board, web portal and any other collaborative tool to provoke substantial improvement in information generation, pooling and supply to the intellectuals
- Sharing best practices of information potential is a commendable idea, but consistent demand for information should be followed up and without a persistant information resource requirement, the knowledge management would become a futile exercise.
- Unless information is updated constantly, and deleted, any knowledge would become stale, as such the relevance of knowledge demands skills of the operating professionals. Thus there is no end point of limit to knowledge programme. As such knowledge management be evolved around latest information and research in every aspect of ongoing endeavours.

5. CREATIVE VALUES

The knowledge workers / librarians have to create value from their intangible information resources and they need to take initiatives with external resourceful environment, internal research personnel and competent professionals for handling information dissemination.

The external resource initiatives be:-

- Establishing contact with users to gain information and knowledge. Links are to be established through NET with knowledge generators *viz.* scietists and researchers to create

new generations of software at par with the fast pace of information generation assets

- New relevance generating sources be exploited effectively. In other words patents in various disciplines are to be put into database, whereby patents usage by new divisions of knowledge explorations can avail the services at additional cost - which forms the revenue to the knowledge environment

The internal resource generation initiatives include:-

- Sharing builtup knowledge for existing products and innovation processes. Creativity and learning help generating information and thereby revenues as well
- Spreading tacit knowledge after its capture and storage in database enables innovative solutions through database sharing globally with websites
- Measuring knowledge and its creativity in processes enables information systems management—which adds value to knowledge.
- Adequate support to educational endeavours with innovative communication technologies—Distance education system envisages learners interact *via* Internet and *via* E-mail
- Reduction of costs duly projecting information objectives to change the mindset of library professionals through explicit communicative knowledge.

6. SUPPORTIVE TECHNOLOGIES

Knowledge management tools run the gamut from standards, off - the shelf E-mail packages to sophisticated collaborative tools designed specifically to research information building and identity. The technologies include knowledge repositories, expertise access tools and e-learning applications, interactive technologies and search and data mining tools.

7. CONCLUSION

Knowledge is more organic than mechanical and thus knowledge should be subjected to isolation. In the knowledge universe, every factor needs to be assessed appropriately to serve the user effectively. Knowledge is essentially organised through group identity and the purpose of information destination. The

knowledge community extend beyond the Net and it travels *via* language and through various research experiences. Expanding organisational knowledge means the development of languages to describe experiences. Knowledge demands constant refinement and the best approach is to keep open the options and channels through welltrained professionals. Knowledge management is essentially to benefit the social environment and society. To advance its way, all barriers in the knowledge organisation be removed and the policies made supportive to the environment. A keen focus on knowledge competencies leads to seeking more effective ways to gain, create, adapt and apply knowledge.

11

Library Services to Distant Learners in India : A Case Study of SDLCE

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ABSTRACT

Libraries play an important role in the economic, political, social and cultural development of a nation. In distance education libraries play a greater role. The learners in Distance Education System (DES) need books to acquire knowledge and support for their studies. The distance education institutions need to strengthen libraries, to provide alternative support to learners. The present study highlights the library services which are provided by the SDLCE. Suggestions are made for strengthening the library services.

1. INTRODUCTION

The distance education has come as a boon to the those who have discontinued their studies because of various constraints either in regular education system or in the personal life. The distance education is taking education to the door steps of students who are willing to acquire higher education. It is particularly relevant in a country like India where a large number of students are dropping their studies at various stages.

Libraries play an important role in the economic, political, social and cultural development of a nation. In distance education libraries play a greater role. The learners in Distance Education

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System (DES) need books to acquire knowledge to support their studies. Certainly, the distance education institutions need to strengthen libraries, to provide alternate support to learners.

The need for providing strong infrastructural facilities including library services for the successful operation and implementation of distance education programmes need not be over-emphasized, since there is a wide geographical gap between the learners and the institute in distance education. In the absence of good books the students will be driven to cheap material like guides, notes etc. which are nothing but capsuled information. They give brief information on the required subject to the students, often erroneously and shabbily presented, for mere passing examination. The students of distance education not having any opportunity to access the standard books and periodicals in different disciplines, acquire shallow knowledge in the subject only by reading them. The inevitable consequence of this would be an erosion of the standard of education.

The present study is a case study of the library services offered by the SDLCE, a Distance Education Institute, Kakatiya University, Warangal. This study describes the present situation of the library services at SDLCE. At the end suggestions are made for strengthening the library services.

2. SDLCE : A PROFILE

The School of Distance Learning and Continuing Education (SDLCE) established in 1988, is located at Kakatiya University, Warangal. The main aim of the school is to provide equal educational opportunity for all adult Indians in general, the residents of Telangana districts of Andhra Pradesh in particular, regardless of their prior academic credentials. The school is focusing its attention mainly on advancing knowledge by diverse means not generally found in formal system of education. In this process the school has scheduled its own programmes aimed at covering large segments of population, vocations, professions and maintenance of a high quality of course material, teaching, training, counselling and guidance.

Presently the school is offering 62 academic programmes at different levels *viz.* Certificate, Undergraduate, P.G. Diploma, Post-Graduate and Research programmes for both professionals and non-professionals, and in-service candidates who have no

basic academic qualification.

The school has so far established 4 regional centres and 62 study centres operating both at district and mandal level in Northern and Southern parts of Telangana, Andhra and in Rayalseema regions for serving the educational needs of about 28,000 students being enrolled at different levels of higher education.

3. LIBRARY SERVICES AT SDLCE

Though, the library is in its infant stage it has been providing different services to learners. The library is functioning under the supervision of the Director and with the assistance of a temporary library personnel. At present the library collection is around 8000 books, 2000 course materials of IGNOU, SDLCE and other prestigious distance education institutions, 1000 audio cassettes, 500 video cassettes and 50 Compact Disks etc. covering various subjects. The library is developing its structure and content at a rapid pace. With an initial allocation of Rs. 40,000 in 1991-92 its budget has risen to Rs. 4,00,000 by 2001-2002. The working hours of library are from 10.00 a.m. to 5.00 p.m. on all working days.

Table 1. Budget allocation for Library

Year	Budget (Rs. In Lakh)
1991-1992	0.40
1992-1993	1.00
1993-1994	1.75
1994-1995	1.75
1995-1996	2.00
1996-1997	2.25
1997-1998	2.25
1998-1999	2.50
1999-2000	3.00
2000-2001	4.00

With its varied collection the library offers the following services for the benefit of the learners :

(i) **Lending Service :** This service plays a pivotal role in dissemination of information to the users/readers. It implies Dr. S.R.Ranganathan's first law **"Books are for use".** The library has a unique feature of lending books to distant learners of certain courses at postgraduate and research level. It would be interesting to note that in the matter of lending facilities and budget allocation, the library of SDLCE stands in forefront when compared to other distance education institutes.

(ii) **Reference Service :** It provides reference services to the learners. It contains several texts, encyclopedias, dictionaries, year books etc. and all those are accessible to the students, counsellors and staff members in their leisure time.

(iii) **Postal Service :** It is also significant to note that the school has introduced the Postal Library Service (PLS) on experimental basis. Under this service, the books are sent to the learners of particular courses by post and those issued books are to be returned at the end of the academic year.

(iv) **Audio-Video Services :** In addition to the class room teaching activities, Audio-video Programmes are also organised separately as a part of the learning process in the library. At present the facility is confined to certain centres and the school is planning to make it as a full fledged facility for all. About 500 video cassettes and 1000 audio cassettes have already been procured from various sources and still some more will be added very shortly.

(v) **CAS/SDI Service :** The library is providing some personalised and current information services like Selective Dissemination of Information and Current Awareness Service to the learners. As a part of this service the latest developments in all the fields are reported to the learners personally or telephonically.

(vi) **Reprographic Service :** The library has reprography service to provide xerox facilities to the learners who utilise the reference books and other materials not meant for lending

purpose. The school has taken this initiative with a view to enable the learners to get useful information pertaining to their studies.

(vii) **Reserve System :** It is also significant to note that the library is even providing the 'Reserve System' in lending of books. Under this system, books already in issue, shall be kept in reserve to be lent to such learner on its return to the library.

In addition to this it also provides its own library facilities, as a part of Student Support Service (SSS) The school is providing opportunities to the learners to visit the University Library which is located on the campus of Kakatiya University for consulting the reference materials like books, theses, journals, periodicals etc.

4. COUNCLUSION AND SUGGESTIONS

On the whole, the SDLCE library is functioning effectively and catering to the needs of a wide range of readers. Particularly, it is an innovation on its part to introduce the lending system and thus allowing learners to have more access to the books.

In order to make the library services more effective, efficient and meaningful for the benefit of learners following suggestions are made.

(i) The periodical section of the library is to be strengthened.

(ii) The library needs more financial support from academic bodies like UGC, DEC and COL as it is in its infant stage and there is a constant rise in the learner numbers.

(iii) It is time for the library to have a full-fledged librarian to develop it further on scientific and organisational lines.

(iv) The library is to be computerised to provide wide range of information services at the least time and cost.

(v) For the success of the distance education programmes, it is very much essential to develop the library and its services to expectations of the distant learners.

(vi) Since the distant learners are scattered in remote areas, they need the library facility at their doorstep. As such it is pertinent to introduce mobile library facility to the remote areas.

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12

Library and Information Science And Logistics

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ABSTRACT

The paper attempts to diagnose the failures aflicting the library profession. It suggests ways to overcome bottlenecks arising in the way of elevating the profession to further heights.

1. INTRODUCTION

There was a time when college librarians were struggling for academic identity, there was a time when college librarians were agitating for parity in pay scales with that of teaching staff, there was a time when college librarians were pleading for summer institutes to update their knowledge, there was a time when college librarians were seeking extension of the scheme of faculty improvement programme, there was a time when college librarians were approaching authorities for rectification of several other anomalies. Thanks to UGC and several state governments, almost all the demand, yes, Just demands were met with. The sacrifices and the concerted efforts of librarians and associations cannot be undermined. A librarian is called a teacher thus the academic status was accorded. He is also paid at par with teachers thus the parity in pay scales is granted. Various academic staff colleges are conducting refresher and orientation courses in Library and Information Science for college librarians and the scheme of F.I.P. is extended to the college librarians and a large number of college librarians are pursuing their Ph.D / M.Phil. programmes through

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this UGC scheme. Now that the college librarians have achieved almost all that they wanted the ball is in their court to prove their mettle in providing efficient services. They have crossed many hurdles and are in a comfortable position paywise and status wise. Now what we and the society expect from the body of college / academic librarians ? It's the time for introspection !

There is no 'feel good factor' in the library management anywhere. The persistent news is of shrinking budgets, dipping clientele, falling standards and crashing library ethos. It is a long way from the days information technology and automation were magic words promising transformation for providing efficient library services. This is the moment for real stocktaking. Ever since the launching of ambitious INFLIBNET programme several universities have taken up to automation. The INFLIBNET has done wonderful work by organising annual reviews – the performance by almost all the universities, was pathetic. If the reports were to be believed only 15 libraries have computerised their libraries in all respects. It found utter cluelessness and zero performance on the one hand, and good intentions not supported by effective action on the other.

2. PITFALLS AND POLICY FAILURES

Lack of commitment, refusal to learn or adopt to new technologies, disappearing work culture among library personnel, and leaderhsip crisis have become regular topics for discussion. It is reported that 75 per cent of the libraries have no professionally qualified librarians. (Very sad commentary of course).

Emphasis on classroom oriented education and neglect of library oriented education, despite specific recommendations by Dr. D.S. Kothari in his report way back in 1964, is good neither for the society or to the community of librarians. Librarians should say good bye to the concept of free luch. Indolence on the part of library personnel will further damage the profession and it will be looked down upon. These were the few maladies plaguing the library profession identified by various agencies.

3. LIBRARY AND INFORMATION SCIENCE EDUCATION – REALISTIC ?

We have seen many innovations in library management from the days of Dewey and Ranganathan. The profession has transformed

from the custodian to librarian, from librarian to to documentalist, and from documentalist to information scientist. Today he has reached the prime place in this knowledge society yes !. He is now the knowledge facilitator. Various library schools in India and abroad are the first ones to catch up with such the advances. Several user studies were made and necessary modifications were introduced in the syllabi. As a result the product coming out of LIS school is duly equipped to meet the modern requirements and challenges. We have heard enough of classification schemes and cataloguing procedures. The DDC is the much used scheme of classification and UDC is accepted in scientific libraries. Today, after a thorough discussion and testing, the AACR II is internationally accepted as the standard catalogue code for converting manual catalogue of MARC (machine readable catalogue).

The emphasis on information technology should not be reduced to a ritual. Unless the profession is thorough with the use of electronic gadgets, the service we render to the end user will be archaic. Computers, scanners, DVDs CD ROMs, the multimedia-Internet-intranet, electronic library, digitisation , digital library, virtual library are the concepts which have found their way in modern libraries and become essential part of library system for processing, storing and dissemination of information. The extensive use of these gardets made retrieval function more effective. If once the network is created all the libraries can hook to the national network to download / upload information and thus directly or indirectly document procurement process can be rendered easy. Unnecessary duplication can be avoided in these days of budgetary constraints.

An examination of syllabi in LIS schools in India reveals that it is ideal for preparing the student for manning any type of library be it public library / academic library or scientific library. Syllabi include classification schemes, cataloguing pocedures, information services products, universe of knowledge, library management, information technology etc. It is almost a hold all. Library and information schools are quick in adopting new techniques in all spheres. For example, the concept of total quality management in libraries' – is very much discussed and libraries are reaping the benefit by introduction and experimenting the concept of TQM in libraries.

Something concrete should be done in this direction instead of boasting about the preparation of a great curiculum development report. The ideal, one would appreciate, is the accountability of teachers who are engaged in imparting knowledge. This is the main criteria to make library service more meaningful and purposeful.

An objective evaluation of the teacher will have electrifying and excellent effect on the student of library science. Teaching and training in Library and Information Science should be rigorous so that people with aptitude for library service only would enter Library Information Science schools. The future librarian should not only be good at using modern electronic gadgets but also a real facilitator of knowledge. The primary job of a librarian is to read. The love for books and love for reading alone makes the library peronnel respected and revered. Let us wait for such a good and glorious day.

4. LOGISTICS AND THEIR APPLICATION TO LIBRARY AND INFORMATION SERVICES

Till very recently, the classics – be in in literature, science, humanitities – were the most stacked books in libraries. How best you serve was the key differentiating factor for libraries engaged in dissemination of knowledge. In due course, dissemination of knowledge at comparatively low price has become the winning criterion.

Today, responsiveness to the reader's needs is the key determinant. A library that caters instantly to the needs of the readers is the winner. Integrateu logistics can serve as a potent tool for success in these days of information explosion.

Logistics is an organised process of managing the flow of documents / reading material from the source of supply, i.e., the book seller, book publisher or the author himself through internal processing function like book selection, acquisition, technical processing, i.e., classification of cataloguing, stacking, and ultimately to put them to use for the benefit of the reader (all the functions and subfunctions, systems and subsystems obtained and applied in library management would come into this category).

With information technology induction into library activities the documents acquisition can be made online, but acquisition of

right documents depends upon the selection of right document supplier. The difference between effective library service lies in the quality of library personnel. (Success or failure).

Today, logistics, the nerve centre of any library system determine the competitive advantage in a big way. Logistics management which can be applied to LIS covera wide range of disciplines – personnel management, document management, stack management and processing management etc.

4.1. Personnel Management

Irrespective of the size of the library, personnel in a library, professional or supporting staff, consume a major chunk of the budget. Thus effective personnel management is a must in these days of budgetary constraints.

4.2. Documents Management

This is yet very vital function of a library – Document selection, document ordering, i.e., acquisition comes under this head and to be effective modern techniques have to be adopted, late here gadgets have to be acquired. Computers should be used for these house keeping activities to save the time and money. Speedy processing is possible only if all these activities are fully automated.

4.3. Processing Management

Well versed and well conversant professional staff should be put incharge of these very vital activities. If the documents are not properly processed there is a possibility of keeping the same title in different files. The staff should be encouraged to attend summer institutes and orientation programmes in LIS for updating their knowledge with the latest developments. Suitable scheme of classification / and proper cataloging code have to be chosen.

4.4. Stack Management

A misplaced book is lost is the first principle in Library and Information Centre. Proper bay guides – INDEX cards are to be provided so as to help the reader to reach for the book without the help of the library staff. This is one area where library staff faces criticism from the reader. Hence the documents should be sorted out and kept in the order shown in the Bay gudies and index cards.

The concept of logistics is discussed in a peripheral level and needs through examination. Ranganathan's flow charts (work carried in various departments in a library, should be made the guiding principle while giving a final shape to the theory of logistics to be applied to libraries.

Every librarian should strive to achieve the proverbal seven 'R' s delivering the right document in the right quality and in the right package, at the right place, at the right time for the right end user at the right cost. Application of logistics management skills ensure all the seven 'R' for effective library and information services.

5. CONCLUSION

After scanning library science syllabus various Library and Information Science schools and after experiencing the quality of teaching and teachers in several university departments and the deteriorating library service in libraries one is reminded of an anecdote which has relevance for all times.

Somebody from the elite group asked, "can you name three successes of the Cuban Revolution?" pat came the reply "Educare, medicare and physiquare (sports)".

"Can you name three failures?" the reply was prompt and instantanous. "Yes ! breakfast, Lunch and Dinner". One may dub it as a political joke but definitely it is a fact to great extent. In todays Library and Information Science Schools in India, we can comfortably list out the three great successes as (*i*). Proliferation of Library and Information Science Schools (formal and distance mode) (*ii*), Curriculum development report of the UGC (*iii*). Introduction of information technology as a part of course content in all the Library and Information Science. Yes ! Wonderful. There is no grouse. Nevertheless, the flip side includes: (*i*). Deteriorating library ethos (*ii*). Apathy twoards work culture, and (*iii*). Declining reading habits among library personnel. If these three problems are properly addressed, we can reach new peaks in library and information service.

13

Establishment of a Documentation and Information Centre as an Electronic Library : A Case Study of Rajiv Gandhi National Drinking Water Mission, New Delhi

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K.N. JHA***

ABSTRACT

This paper discusses the basic objectives of establishment of a Documentation and Information Centre as an electronic library for the Rajiv Gandhi National Drinking Water Mission New Delhi. It also discusses in detail the basic requirements, such as site preparation, interior works, furnishing, establishment of Local Area Network and other equipment infrastructure, operating requirements such as technical processing, resource acquisition, dissemination and Management Information System (MIS) requirement. The establishment of the Centre has been discussed in detail, mentioning the system setup, resource acquisition, design and development of information products, services and extensive networking with international databases. The marketing of information products and services has been suggested in order to make the Centre self-sustainable.

1. INTRODUCTION

Developments in Information Technology (IT) are happening in

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several areas of activities namely Central Processor Technology, Storage Technology, Network Technology, Imaging Technology, etc. All these technologies have led to the development of Internet, Intranet, Extranet and websites. These are being perceived and practised by library professionals to facilitate the flow of information by applying the technologies. That is why scholars are now able to use a variety of networks to access sources needed in their research, to exchange information and collaborate in research and publishing activities. Electronics offers the potential for more effective dissemination of information. Such electronic facilities can be exemplified by the journals tailored to individual interests and the increasing use of hypertext and hypermedia, which have given a new dimension to retrieval of information. Through these developments, a new form of library which is variously termed as electronic library or digital library is emerging. For the present case study, Electronic Library is defined as the library that has collection of information in electronic form, such as in hard-disk, optical disk, CD-ROM, online, etc and provides services over cables and telecommunication lines.

The present study is based on the establishment and functioning of the Documentation and Information Centre of the Rajiv Gandhi National Drinking Water Mission, New Delhi.

2. THE GENESIS OF THE DOCUMENTATION AND INFORMATION CENTRE OF RAJIV GANDHI NATIONAL DRINKING WATER MISSION

Rajiv Gandhi National Drinking Water Mission (RGNDWM) is an apex body under the Ministry of Rural Development, Government of India in order to provide scientific, technical and financial assistance to the states and Union Territories for the rural water supply and sanitation. To satisfy its fundamental task, the Mission was in need of a documentation and information centre to help the implementation of its programmes and support its research and development (R & D) activities. It was also felt that proper documentation of information generated by the different agencies, of the Mission for dissemination at the national and international level was required. To fulfill these requirements the Mission decided to establish a Documentation and Information Centre (DIC). The Mission expressed its desire to the Indian National Scientific Documentation Centre (INSDOC), New Delhi and sought

the expert support for the establishment of the DIC. INSDOC took the responsibility and prepared the feasibility report. In the feasibility study, INSDOC suggested a hybrid model for the Centre. The model was approved by the Mission and INSDOC accepted the job of setting up of DIC for the Mission.

A thorough survey of the resources, and their availability, and the users' requirements for information and was conducted. It has been found that most of the required information is of outside origin and available in digital from. The target user groups are geographically scattered at different locations. On the basis of the above considerations, a hybrid model for the proposed Electronic Library was recommended.

2.1 Implementation Phases

The following implementation phases were identified for the setting up of Documentation and Information Centre (DIC) for RGNDWM.

2.1.1 Feasibility Study

INSDOC identified the core programmes of the Mission, information needs of different user groups, and agencies working under the Mission. An extensive study of information sources available in print media as well as in electronic media at national and international level was made. Since the geographical area of the Mission activities is very large, the dissemination of information through conventional method was found to be very difficult. So a comprehensive study for exploring modern technology for storage, retrieval and dissemination of information was conducted. On the basis of the study a Hybrid Model (electronic and conventional) for the DIC was prepared for its implementation. To satisfy the financial need for the DIC, it was proposed that initially all the expenses will be borne by the Mission, and after a certain period of time DIC will be selfsustainable through its own products and services.

2.1.2 Objectives of the DIC

The objectives of the Centre have been categorised as primary and secondary objectives.

a. Primary objectives

(*i*) Rendering of variety of relevant information services.

(*ii*) Documenting all drinking water and sanitation related technologies emanating from the efforts of the Mission sponsored programmes and from other sources.

(*iii*) Creation of computerised databases and dissemination of data and information generated by *the mission* sponsored programmes.

(*iv*) Identification of information gaps at a national level in the sphere of activity of the Mission and filling up of the gaps by acquiring or establishing access to relevant information sources within the country or abroad.

(*v*) Building up of core information resource by acquisition of relevant journals, monographs, CD-ROMs etc. from, national and international sources.

b. Secondary objectives

(*i*) Networking with other institutions and information centres in the country and abroad.

(*ii*) Access facility to international online systems like DIALOG, STN International

(*iii*) Establishing connectivity with different network systems *viz.*, NICNET, INTERNET, ERNET, etc.

2.1.3 MIS requirement for the Centre

The Management Information System requirements are meant for carrying out the job (required to setup the DIC) and to satisfy the information need of different user groups. Fulfilment of the information requirements of the user groups was considered important in order to carryout the concerted effort of implementing the job.

3. INFRASTRUCTURE DEVELOPMENT

After the preparation of a detailed, qualitative and standard plan, the dismantling and interior work started in approximately 100 sqm area as per the layout plan. To house the various services units and facilities, the layout plan earmarked the allotted spaces as: server, reader, technical processing, circulation, stacks and staff areas. To meet the requirements of proper space planning, the

services of the consultants from the School of Planning and Architecture, New Delhi was contracted for interior designing work, electrical consultancy, air-conditioning consultancy and construction management services. The scope of construction management work includes planning, tender action, construction schedules, tender documents, technical specification drawings, pre-qualification of contractors, coordination and quality control, and qualified manpower deployment at construction site.

3.1 Civil and interior work

Proper and minute designing of the available space was required because the area made available to the agency was mere 100 sqm, The work that followed included partitioning of space for different activities, false ceiling for air conditioning, wall furnishing for aesthetic look, design of computer furniture etc. the jobs were completed in the stipulated time framework. The interior design of the Centre is given below.

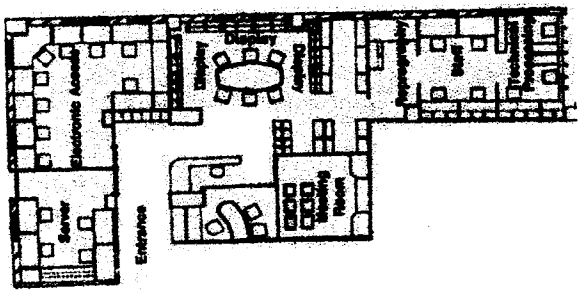


Figure 1. Interior Layout

3.2 Electrical and fire detection work

For carrying out required jobs in mechanised environment, planning at the minutest level was required. To carry out the same, a new main distribution board was proposed for electrical systems. The electrical distribution was made through MS Conduits/ floor trucking for telephones, UPS, plugs and computer systems. The

existing fire-detection system was retained and an additional fire alarm system was set up.

3.3 Specifications, design and material selection

The following documents and design drawing were brought out at vario us stages:

(*i*) Technical specification and design report (for Ministry of Works, CPWD)

(ii) Civil and interior works: specifications and schedule of quantities

(iii) Electrical works: specifications and schedule of quantities

(iv) Air-conditioning: specifications and bill

(v) Special contract conditions and fiscal aspects

(vi) General contract and conditions

(vii) Tender document for integrated work package.

(viii) Design drawings: layout plan, 18 technical drawings.

4. EQUIPMENT AND PERIPHERALS

a. File server:

Intel Pentium III 800 Mhz or above processor, 128 MB SD RAM, 20 GB ultrafast SCSI, 64 bit PCI(10/100 Mbps)-3COM Ethernet Card, 512 KB pipelined burstcache, enhanced serial ports and one serial port.

b. CD-Server

Pentium II processor, 64 MB RAM, CD-ROM drive SCS-II Compatible, 14 drives tower, UNIX, OS2, Windows, Compatible to CD-ROM resources-bibliographic, full text and multimedia, Built - in Ethernet card MSCDEX support.

c. Networking Items:

Hub: 24 ports, 10/100 MbPS with software, cabling UTP Cat 5, Jack panel.

5. NETWORKING FOR EXTERNAL AND INTERNAL ENVIRONMENT

Networking to Internal Environment consists of the CD-ROM Networking under a LAN. The Networking of Internal Envoirnment consists of the Internet connectivity.

5.1 CD-ROM Networking

(*i*) The DIC opted for a client-server configuration for its CD-ROM networking.

(*ii*) In this arrangement, one computer, which is called the server is usually bigger, powerful, faster and has more storage capacity.

(*iii*) All the other computers connected to this server are called nodes or clients.

(*iv*) A typical server can handle hundreds of clients.

(*v*) The server can be dedicated or non-dedicated, depending on the requirement.

(*vi*) A dedicated server can only do the job for which it is configured, whereas a non-dedicated server can also work as client in addition to its role as server. In this kind of network, computers with different operating systems can also communicate with the server.

(*vii*) In this configuration, the CD-ROM drives are connected directly to the network fileserver, a dedicated PC that provides network services or resources to all workstations on the LAN.

(*viii*) Software that controls the CD-ROM drives is located on the file server.

(*ix*) With the most commonly used network operating system, Window NT, the CD-ROM networking software is located as Network Loadable Module (NLM) which is provided by several vendors.

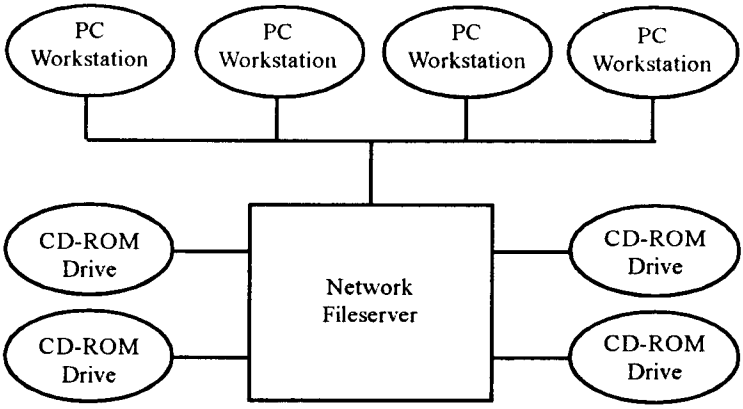


Figure 2. Client-server Diagram

5.2 Networking for External Environment:

The figure 3 shows the entire network with the external connectivity through the Internet.

18 Pentium Systems (in Working Areas)

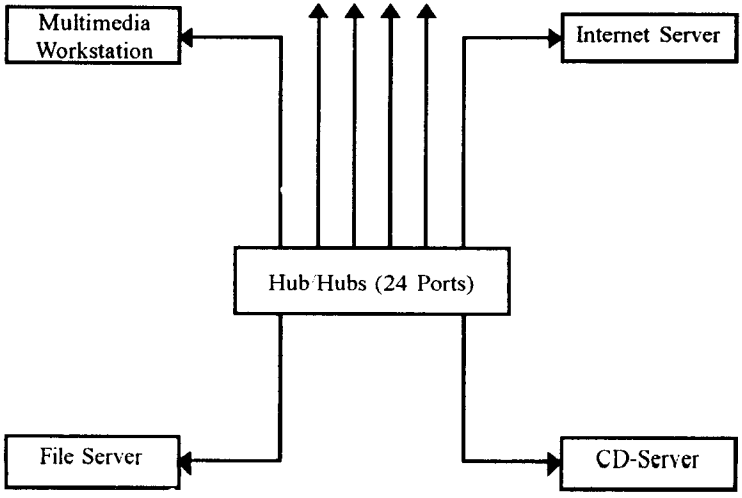


Figure 3. Schematic representation of the Network Connectivity

6. BUILDING OF INFORMATION RESOURCES

6.1. Information Sources

The Centre's collections in the field of drinking water and sanitation are in the forms of books, journals, reports and CD-ROM databases. It has procured a wide range of CD- ROM databases, full text CD-ROM journals in the related fields as well as serials and monographs in printed form. The Centre subscribes to over one hundred core journals in print form in the areas of drinking water and sanitation and has about 1000 Indian and foreign books and a few hundred reports.

6.2. CD-ROM Network

To facilitate wide and concurrent use, the CD-ROMs are made available on a 14 drive CD-tower server linked to Pentium based LAN. The CD-ROM resources can be browsed in the electronic reading area of the Centre.

6.3. Internet Facility

The Centre has obtained Gateway Internet Access Service (GIAS) facility. Internet, a worldwide network of networks, provides opportunity to the user to use the information on it, which is growing at a phenomenal rate and permits to use E-mail, file transfer, remote login, mosaic, World Wide Web (WWW), online services, etc to the users.

6.4. E mail Access Facility

The Centre has established linkage with SIRNET facility developed by INSDOC, thus providing access to CSIR laboratories and other research and academic organisations. This facility also provides the users to search the various indigenously developed online databases.

6.5. Online International Access

International online information systems comprising thousands of databases have been made available from the Centre by connecting the computer through VSNL's Gateway Packet Switching Services (GPSS) subscribed to satellite based international networks in USA and Europe.

6.6. Automated Library

To carry out library automation job, Granthalaya software was selected, since it supports Common Communication Format. The in-house staff were deployed to fill the bibliographic information in data sheets for the available documents. Data feeding was made possible by hiring a vendor service. Documents were classified using Universal Decimal Classification (UDC). Bar-coding of the document was done by in-house printing of the barcode through thermal printer. Barcode based membership card was prepared for the specialised users. Now the library at the Centre is fully automated, and its entire holding is supported with barcode technology. The computerised catalogue helps the users in searching for a document easily through a variety of options like author, keywords, title etc. The other library functions like circulation, acquisition and serials control are also computerised to help in efficient functioning of the library.

7. DIC INFORMATION PRODUCTS AND SERVICES

The DIC offers following information services with the help of in-house resources as well as through INSDOC resources. The international databases are also being searched using Internet, SIRNET and STN services.

7.1. Technical Enquiry Service

The Centre has provision to meet the technical enquiry of the end-users from the available and other accessible information resources.

7.2. Literature Search

The current and background information are required for the pursuit of research and development (R & D) activities. Computerized literature search services help in retrieving such information. The CD-ROMs acquired by the Centre are on Local Area Network. Facility has been provided to users to browse and search the CD-ROMs themselves. Some indigenous databases are of interest to the Mission researchers. INSDOC as an online host provides access to ten indigenous online databases through SIRNET. Examples of the databases include Current Contents of Indian Journals and Indian Patents. About 100 international

databases are directly relevant to the Mission programmmes and disciplines are available through international online systems DIALOG and STN International.

7.3. Selective Dissemination of Information (SDI)

Personalised information services are supplied to individuals or groups on the basis of user interest profiles by searching information from CD-ROM databases, computerised databases and remotely accessible online databases. The service is offered on regular basis. The requests for Contents, Abstracts and Photocopy Service (CAPS), Chemical Abstracts Keyword Service (CAKIS) and Standing Order Abstracts Services (SOAS) available from INSDOC have been offered to the Mission users.

7.4. Document Supply

Request for photocopies are met from the Centre's resources. Items for which references are not available with the Centre will be met from INSDOC.

7.5. Other Services

Technical translation services are offered to the Mission's users from foreign languages to English and *vice-versa* by INSDOC.

8. QUALITY MANAGEMENT PROGRAMME

The operation of the DIC is being smoothly maintained with the motto to provide latest, pinpointed information to specialised group of information seekers. This is because of the fact that information has now been recognised as the most powerful tool and valuable asset for commercial and corporate environment. Information is also considered as key to lead and thrive in today's cut-throat competitive world. In this process, a Quality Management Program has been adopted in the Centre for the services and products to provide customer satisfaction. The Quality Management Program is also being implemented in order to equip the organisation to have a strategic advantage in productivity, profitability and efficiency at a very reasonable cost.

9. CONCLUSION

With the provision of information resources to the users through networking by electronic means, the Documentation and Information Centre at the Rajiv Gandhi National Drinking water

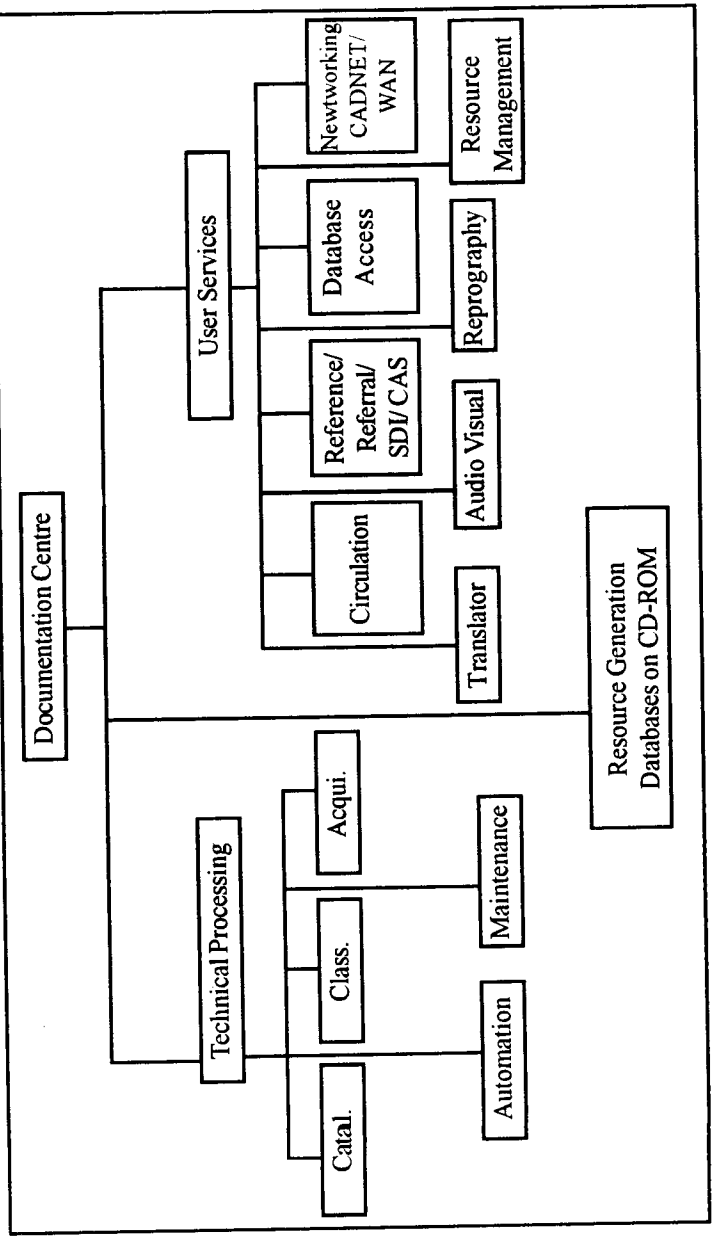


Figure 4. A Schematic representation of the Organisational Structure

Mission is fast becoming an Electronic Library. Since the mission for drinking water is a vital to the nation, the information services provided should also be right and timely. The entire project is envisaged to attain this goal.

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14

Revitalising the University Library Services in the Rapidly Changing Environment

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1. ABSTRACT

The rapidly changing environment has a message for the library and information (LI) professionals. It is concerned with changing our thinking and redefining our role in the emerging knowledge-based society. LI professionals are required to know about the needs, expectations and aspirations of the end-users. They are essential to add value to their services by developing their competencies. Total Quality Management (TQM), Tacit Knowledge Management (TKM), and Wisdom Management are three main areas with which library leaders and managers should act strategically.

1. INTRODUCTION

The university libraries are operating in a paradoxical situation of paucity in plenty. On the one hand there is a resources crunch and on the other there is information deluge, and a growing diversifying universe of users. Each end-user has his / her own expectations and aspirations. In order to revitalise our services, library and information leaders and managers are required to redefine their roles and ensure end-users' delight at any cost. But this is not an easy task. Two biggest challenges before the library and information (LI) professionals are:

1. to convert challenges into opportunities, and

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2. to save our future from relapsing into past

For this, library leaders and managers are supposed to take stock of the changing environment and act accordingly to revitalise the university libraries. We must remember that our survival is totally dependent upon the survival of our libraries. Our motto should be to establish our position in a the society like doctors and lawyers.

2. ENVIRONMENTAL CHANGES

If we look around, we find ourselves surrounded by psychological, ideological, political, socio-economic, educational, cultural organisational, technical and technological changes. Economic and technological changes have affected the university libraries in a perceptible manner. Declining library budgets and new developments in information and communication technologies (ICTs) are forcing the library leaders and managers to ensure their value to the immediate community and society at large at any cost. Here also, they are stuck in a paradoxical situation that is, they are required to provide new services without abandoning the old ones. World Wide Web and the Internet are the striking developments of our times. New services, such as OPACs, e-journals, mailing lists, scholarly discussion lists, computer conference, bulletin boards, search engines, portals have changed face of communication. University libraries are not an exception to these developments. In this context, library leaders are required to provide leadership to the profession for its surviving and thriving in the emerging knowledge-based society. For this, we will have to re-interpret our philosophical moorings and reformulate our policies and strategies. This becomes important if we look beyond postmodernism. Even though the postmodern paradigm is based on spirit, chaos and diversity, yet it fails to explain the realities of life just like modernism, which is based on reason, order and homogeneity.

Our main problem is that many of us try to provide partial and static solutions to multi dimensional and dynamic problems. In fact, we should adopt a holistic approach and systematic thinking to manage chaos, celebrate diversity and ensure team spirit for cooperative ventures. Wisdom management, *i.e.*, adding values and perspectives to explicit and tracit knowledge and then applying it strategically, should be the main concern of the LI

professionals.

3. PARADIGM SHIFT

The hierarchical, bureaucratic and mechanistic methods of the industrial era are not fully successful in the context of knowledge management and information handling. In the knowledge-based society, team spirit and proactive attitude; interest and confidence in the capability and aspirations of others; transformation of both raw material and raw ideas; exploitation of both capital and knowledge assets; and cooperation and collaboration are *sine qua non* for human progress. The knowledge era is based on uniting and multiplying instead of dividing and mechanistic mechanisms of the industrial era. In knowledge based society successful leaders and managers are not supposed to find faults with their followers and co-workers, rather they are required to appreciate their capabilities and to develop them further. Respect for difference of opinion and a shared vision are the two essential conditions for co-creation. There is no absolute strategy for success; rather application of bottom-up and top-down approaches according to the gravity of the situation can prove to be highly helpful. The proceeding part of this paper is developed on the basis of the above said change.

4. KNOWLEDGE RESOURCE MANAGEMENT (KRM)

Gone are the days of human resource management. One does not manage people rather one leads people. Today managers are talking of empowering the knowledge workers. That is why the heading Knowledge Resource Management is preferred to Human Resource Management. Knowledge is of two types; explicit and tacit. It is very difficult to capture and utilise the tacit knowledge because it is dynamic, personal and strategic unlike the explicit knowledge that is documented wisdom and static by nature. If the humanware is not in high spirits, then all other parts of the university library system are not going to work. It is the man behind the machine; it is mindset of the man, which makes the real difference. We are required to change our mindsets to create change, and to lead the profession into sustainable future. Since the development of ICTs, the Internet and the Web, the library is no more place, rather it is a concept, a function and a gateway. In other words a library is becoming a private space from and as

such librarie claim for public funding is also on the decline. Hence it is high time that the library leaders and managers take note of this challenge and adopt the best library practices to revitalise university libraries so that they are able to cater to the needs, expectations, aspirations of end-users as well as prove their value to society. To change the mindset of people library leaders and managers are required to identify with the needs, expectations and aspirations of their followers, colleagues and subordinates. LI professionals will have to change their outlook by developing a service spirit and a proactive attitude. For this Total Quality Management (TQM), Tacit Knowledge Management (TKM), service process reengineering, and full involvement of one and all in a university library are the essential conditions. TKM cannot be ensured by incompetent staff, therefore, Continuous Professional Education and Training (CPET), life long learning and development of pertinent skills should become a norm for all the stakeholders in a university library. The library leaders and manager have to face necessary changes with courage, conviction, vision and imagination to lead the co-workers a sustainable future. They must provide an ivigorating and exciting environment for one and all. In other words, there should be a sentiment of belonging and a congenial work atmosphere so that everyone is able to perform at an optimal level. There should be reward system for the top performers, and a monitoring mechanism for run of the mill stock. Everyone must feel concerned about university library's mission, objectives and targets as well as about the neds, expectations, emotions and sentiments of the co-workers and the end-users. Effort should also be made for upward management because no mission can be obtained successfully without commitment from the top management. Top management is also facing the same problem. Instead of becoming a part of the problem, we should become a part of the solution. Regular contact with the top management is essential for sharing our experiences and concerns, and building a sustainable university library of the future.

5. VALUE ADDITION

Knowledge accquisition, processing and promotion of its use are the three basic domains of the library profession. Therefore TQM should be the norm in all the three domains. For this, collection development and access management should be based on sound .

development and management policy. Since there is a trend towards access management, more attention should be paid to providing real time access to networked information and digital documents. Instead of focusing on just in case collection development, efforts should be directed towards just in time access to information. This is essential in the context of resource crunch and our decreasing purchasing power. As far a organisation of knowledge and information is concerned, there must be value addition at every step. For this, indexing languages must reflect the changing context and digital formats.

The indexing languages must have provision for digital documents and the Internet/Web based resources and services. In fact, university libraries should work as local gateways to global information. The university OPACs should provide new links and routes. University libraries must do their best to come up to the expectations of the local community of users. But at the same time they should provide global reach to external information. Efforts should also be made to promote the use of resources and services of libraries. Information literacy is good mechanism for this.

6. INFORMATION LITERACY

Though there is a trend towards disintermediation, that is from intermediary to end-user model, yet the librarian, as an intermdiary has not become totally irrelevant. Only his role has changed. Now a days he is required to act as a facilitator. He is to promote information literacy among the end-user, which includes computer literacy and network literacy. In short, it means intermediary's as well as end user's ability to locate, retrieve and use the relevant information strategically. We have been providing library instruction, bibliographic instruction, user education etc. but today information literacy is a pre-condition for success. TKM, TQM and Wisdom Management are not possible without information literacy. Therefore, continuing professional education and training (CPET) and information literacy must become a regular feature for all the stakeholders.

7. CONCLUSION

The bottomline is that the university library leader and managers must take cognizance of the changing environment and work out policies and strategies to come out of the paradoxical situation of

paucity in plenty. For this they need vision, imagination, team spirit, proactive mindset and strong communication skills. Their biggest challenge lies in converting challenges into opportunities and ensuring sustainable university library for the future. It can be done with the help of competent library and information professinals as well as info-literate end-users. In fact, university libraries must shift their attention from process to function that means valuing the values of the end-users. That is not an easy task. For this we will have to co-create a sustainable university library future with the help of co-workers with a team spirit in a stimulating environment, because library as metaphor today is becoming more private space than a public place. In this context best library practices must be based on our best values, best conceptions, best policies, best strategies and best experience within the psychological, ideological, political, socio-economic, educational, cultural, technical and institutional contexts.

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15

What Library can do for the Citizen of the Country

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ABSTRACT

The paper stresses the point that libraries can play a vital role in socio-economic development of the country. India has a glorious past. Universities in Nalanda and Vikramshila had library based education system. Now libraries play an important role in the literacy mission. Users can get access to rare collections which are impossible to find through trade channel. However, the profession of librarianship has so far been neglected by the government. Library lagislation in all the states of the country is still a distant dream.

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16

Internet For Rural Development: Role of Rural Libraries for Quality Information Services in India

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ABSTRACT

This paper discusses in brief the concept of networking and its application in information sharing. It brings out the role of public library in rural development. It enlists the recommendations of Chattopadhyaya Committee on National Policy on Libraries. It discusses the Public Information Centres for Rural Development recommended by NIRD and describes the objectives of Public Information Centres (PICs) and enlists the rural information needs. The author discusses the role of media in rural development.

1. INTRODUCTION

The ongoing advances in science and technology demand corresponding changes in the nature of access to information. Hence, the Library and Information Centres have come to witness a change in their role in collection, preservation and dissemination of information. Today, the developments in computer and communication technologies under broad spectrum of information technology have made profound impact upon library and information systems and their organisational structure and functions. The development of digital representation of information, the qualitative changes in the design and architecture of computers and the available softwares have enlarged the scopeof computer applications in library and information systems and their services.This has given rise to library automation where databases are created. Simultaneously,

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the library automation has led to on-line access to information, enabling instant access to vast pool of information resources on world wide web. The world has also witnessed resource sharing among libraries in the world. The technological innovations have given rise to library networks through satellites which play an important role in collection, processing, preservation and dissemination of information in electronic and digital form. As such the libraries are at the threshhold of electronic age in which electronic media will play a crucial role in providing library and information services.

The ever increasing information requirement, the complexity and economic factors like escalating cost of information, the increasing cost of processing documents, the decreasing budgets, the enormous growth in publications and the emergence of subject specilisation have compelled the libraries and information centres to share information through network. Thus, networking has enabled access to the resources available at distant places around the world.

The world's largest computer network, Internet, appeared during 1969 under a project called ARPANET, a network built by ARPA (Advanced Research Project Agency) in USA in the Department of Defence. Today, the Internet has grown to thousands of regional networks that connect millions of computers, and millions of users are getting benefit of its services. The special feature of this global network is that it is not owned by any single individual company, institution or country, but it is a combined effort of the networks available on the earth. Even, the citizen living in a village is eager to browse Internet for current trends in agriculture or poultry or marketing situation for agricultural products. The Internet is not a panacea for development, but it can and does bring new information resources and can open up new communication opportunities and challenges to people and their organisations, institutions, and governments. People in rural areas are generally unable to take advantage of the services available to their urban counterparts. Rural development programmes generally have objectives such as local participation, training, education, technical backstopping, etc. The rural mases involved in such rural development projects need to communicate and share information across geographical boundaries, across social groupings and within organisations

throughout the production systems. It is here,that the village libraries / rural libraries, considered as the local gateway to knowledge, are making all kinds of efforts to provide information in any form or media to serve the entire population of local community. Today, it is the responsibility of public libraries to provide multimedia system and information to users of any type. Further, everyone in the community, regardless of language or any other considerations, has a right to access information. Therefore, providing Internet browsing for rural mass is a must in the public library system.

2. NETWORKING AND ITS USE IN RESOURCE SHARING

Owing to the situation created by knowledge explosion and consequent flood of information, no library in the would, howsoever big it may be, can think of becoming self-sufficient. Therefore, library cooperation and resource sharing is very essential for effective library services. Today, resource sharing can he organised in two ways, *(i)* Library resource sharing via telecommunication networks; and *(ii)* library resource sharing through databases in optical media.

UNISIT defined Information Network as "a set of interrelated information systems associated with communication facilities which are cooperating through more or less formal agreements, in order to jointly implement information handling operation, with a view to pooling their resources and better services to the users". Whereas library network is "a distribution system composed of two or more libraries and/or other organisations engaged in a common pattern of information exchange, through communications, for some financial purpose."

It is information explosion, increased workload (increase in number of published documents), economic necessity (increase in publication cost and decrease in budget) and multi-disciplinary research that has given rise to resource sharing which in turn is depending on library network.

3. AIMS AND OBJECTS OF LIBRARY NETWORK

(*i*) To evolve a national network, interconnecting various libraries and information centres in the country and to improve capabilities in information handling.

(*ii*) To provide reliable access to document collection of libraries by creating databases and online public access catalogue (OPAC)

(*iii*) To provide document delivery service by centres and to optimise information resource utilisation

(*iv*) To enable the users disbursed in rural areas irrespective of location and distance to have access to information

(*v*) To maintain electronic communication of information for delivering information

(*vi*) To create virtual library system for participating libraries

(*vii*) To provide document delivery through online information access

(*viii*)To introduce E-mail service for information distribution

(*ix*) To provide bulletin board service, and

(*x*) To provide Internet connectivity

4. ROLE OF PUBLIC LIBRARY IN RURAL DEVELOPMENT

The public library is considered as the local gateway to knowledge serving the entire population of a local community. Everyone in the community, regardless of nationality, race, colour, creed, age, sex, status, educational attainments, language or any other considerations has a claim to its share of services as a matter of right.

The UNESCO Public Library Manifesto-1994 proclaims its belief in the public library as a living force for education, culture and information, and as an essential agent for the fostering of peace and spiritual welfare through the minds of men and women. Therefore, the key missions of public library system are: promoting education, fostering culture, dissemination of information and providing recreation. It needs to play the role of an educational, cultural, informational and recreational centre. But much depends on the nature, size and the quality of information resources-print, non-print and electronic-the public library has. The information resources of public libraries should be client centered, need based, relevant, balanced and tailor made to the user community and their aim should be to develop adequate and balanced information resources-in terms of quality and quantity to fulfil its role[1].

5. ESTABLISHMENT OF RURAL PUBLIC LIBRARIES – CHATTOPADHYAYA COMMITTEE RECOMMENDATIONS

Rural libraries are also known as village libraries as a part of the Public Library System in India. The Chattopadhyaya Committee was set up to formulate an action plan on the national policy on libraries and information system, it has strongly recommended for the establishment and maintenance of rural public libraries throughout India. Its main recommendations towards this direction are:

(*i*) Establishment of rural public libraries.

(*ii*) The Ministry of Rural Development and Department of Culture should undertake a plan for building up one community centre with library facilities on every panchayat under the Eighth Plan.

(*iii*) Every public library should have children's section, a minimum of 20 per cent of public library collections should be meant for children.

(*iv*) All public libraries and community centres should have audio-visual materials and equipment for the benefit of the neo-literates.

(*v*) Voluntary agencies should be associated with the state public library development programme.

(*vi*) The publications of Indira Gandhi National Open University should be available in all local public libraries.

(*vii*) All the states and union territories should have a public library act in some form or the other.

(*viii*) The Central government in collaboration with state government, may establish at least one multilingual library in each state.

(*ix*) A national authority of adult education should be set up.

6. PUBLIC INFORMATION CENTRES FOR RURAL DEVELOPMENT-RECOMMENDED BY NIRD

To review the status of rural libraries, the Centre on Rural Documentation (CORD) of the National Institute of Rural Development (NIRD), Hyderabad conducted a "National Workshop on Rural Libraries and Information Centres under

Panchayati Raj" in September 1998. This Workshop made a set of recommendations one of which relates to the establishment of Community Information Centres by NIRD. This recommendation is implemented on an experimental basis as an "Outreach centre" at (1) Vikarabad, Ranga Reddy District and (2) Tenali, Guntur District in Andhra Pradesh during 1999. These centres are called Public Information Kiosks (PIKS). These are established to provide information services to the rural people on aspects like socio-economic and resource profile of the region where they are located, create databases relating to various development schemes in operation, health, education employment facilities available and other related information useful to the rural population with the help of officials of Panchayati-Raj Institutions, agricultural extension and other departments at mandal and district levels.

These centres are equipped with telephone, STD / PCO, FAX, E-Mail and photocopying facilities on payment basis. It is also proposed to obtain TCP/IP dial-up connection for reliability and ease of connectivity. The Internet connectivity will be utilised to download information relevant to local needs and made available in a computer readable format[2].

7. OBJECTIVES OF PUBLIC INFORMATION CENTRES

The objectives of Public Information Centres (PICs) or Public Information KIOSKS (PIKs) are enlisted by K.A. Raju, NIRD as follows[3] :

(*i*) To prepare a profile and resource inventory of the identified blocks including population, literacy, land, water, irrigation facilities, farming pattern, occupations and crafts, folk arts, etc.

(*ii*) To collect technical information relating to agriculture technology development, crop systems, and pattern including marketing of local produce.

(*iii*)To collect utility information regarding health, education, employment, financial and legal topics using resources available from local, state, Central and international agencies and networks in order to supplement and support information needs of the population.

(*iv*) Make an inventory of development programs implemented

in the blocks in order to obtain benefits.

(*v*) Other material which can be made available for the use of rural population using Internet resources.

8. RURAL INFORMATION NEEDS

The rural information needs identified during the National Workshop on Rural Libraries and Information centres organised by NIRD on 9-11 September 1998 are as follows:

(*i*) *Basic needs*	:	Health, water supply, sanitation and other amenities
(*ii*) *Economic needs*	:	Improved crop production, product sales options, market information
(*iii*) *Information needs*	:	Where to find information, policy and service availability
(*iv*) *Educational needs*	:	Textbooks, teaching aids, general education
(*V*) *Recreational needs*	:	Sports facilities, cultural activities

9. ROLE OF MEDIA IN RURAL DEVELOPMENT

Today, it is a well established fact that information is a resource. It is not only resource but it is energy too. It is a catalytic agent that motivates people to take right decision at the right time. So far we have been concentrating more on the information needs of only elites. But now, it is high time to realise that the masses have to be not only informed but well informed. Rural people are not only in need of information regarding agriculture and animal husbandry but they are interested in all kinds of information which may help them for their development.

It is found that media has high influence in creating awareness about modern practices for development. Media is considered as the primary source of information about development practices. However, media has been found to be a catalyst in development process rather than effective initiator of the process. It is instrumental in preparing socio-psychological ground for a take off in development. Hence it is more useful for those sections of the rural population who have passed the take off stage[4].

The media covers those, which use modern means of

communication such as radio, television, exhibitions, videofilms, CD, VCD, Internet and advertising apart from traditional media.

Today, the less educated or even uneducated masses in rural areas have been found interested in T.V. viewing as they can imbibe more information with less efforts. In view of this fact, the quality and coverage of broadcast meant for rural people are to be improved by Doordarshan. Further, multimedia is also playing its predominant role in information transfer especially for the people living in villages. Therefore, the village libraries / rural libraries / rural information centres must equip with all possible media for information.

10. INTERNET FOR RURAL DEVELOPMENT

Rural development programmes generally have objectives such as local participation, training, education, research, technical backstopping and strengthening of institutions and delivery mechanisms. The people involved in such projects need to communicate and share information across geographical boundaries, across social groups, between and within organisations and throughout the production systems. Thus, the role of Internet can be easily perceived as a suitable communication tool cutting across the barriers as well as a potential tool to be integrated into the overall development process.

The right to information should be deemed as a fundamental right for the entire spectrum of our population both rural and urban. This can be achieved only when each panchayat is provided with Internet connection, through which the rural population can get to know much important information regarding cultivation, health care, education, etc. For instance, it is now possible to provide latest information related to seeds, fertilisers, pesticides, etc, to the farmers for improving agricultural production. Similarly, the farmers can be provided with quick information about the storage and marketing of their products.

The Internet is not a panacea for development, but it can and does bring new information resources and can open up new communication opportunities and challenges between people and their organisations, institutions and governments. Unfortunately, in today's knowledge-based economies there are 'information-haves' and 'information-have-nots', and there is a large gap between them. The Internet is not responsible for this gap. But,

unless we can make the Internet tools and other basic telecommunication services like the telephone more widely available, especially to the rural poor, the expanded use of the Internet among the information-haves will widen the gap.

The processes of globalisation and the transformation of industrial and agricultural economies into economies based more and more on information and knowledge infrastructure, require us to devote considerable energy for enabling the 'information-have-nots' to gain access to information and knowledge infrastructures. Without this access, the 'information-have-nots' will be at the mercy of external forces, with little or no ability to understand, respond, or direct the forces that affect their lives. It is imperative to find ways to give access to Internet for intermediary peoples' organisations and local agencies that serve the poor. Rural families who are struggling to achieve prosperity through learning and knowledge no doubt would embrace use of the Internet if it were available to them.

11. BENEFITS OF INTERNET FOR RURAL PEOPLE

(*i*) The most important benefit is probably its use as an inter-personal communication tool that is the foundation of 'participatory communication'.

(*ii*) It enables us to communicate instantaneously, inexpensively, reliably, and globally.

(*iii*)It also increases efficiency in the use of resources.

(*iv*) It can open opportunities to reduce duplication of efforts and promote collaboration.

(*v*) Reduction of communication costs, global access to information and human resources used for planning, consultation, decision making and action.

(*vi*) It is a communication facilitator.

As a rural development and participation communication facilitator, the benefits derived from the Internet use by the rural people observed by Don Richardson are [5]:

(*i*) Farmers in rural Chille got better prices for their crops because they use the Internet to gain up-to-the minute farm market information from the website of the Chicago Board of Trade.

(*ii*) The rural development practitioners in Senegal communicate across their country by e-mail, bypassing a terribly inefficient

postal service by using Internet.

(*iii*)Rural people in Canada used the Internet to sell hay and advertise free Kittens to their neighbours.

Further, Don Richardson learned several lessons by creating a community-oriented Internet service in the country surroundings of Canada for two year during 1993-1994 and said that the establishment of community network extension services, regionally, nationally, or locally could provide programmes for enabling rural communities to develop strong community organisation strategies for establishing community networks.

Recognising the benefits of Internet for rural development the Government of Andhra Pradesh came forward to provide Internet *dabas* at each mandal so as to reach its use to rural mass. It is right time for public library system to extend Internet services to rural mass through village libraries or rural libraries or rural community information centres in all states in India.

12. CONCLUSION

Rural development is directly dependent on three main activities, *viz.*, extensive planning, effective monitoring and efficient management of information regarding the rural people, their livelihood, education, health, environment, governance, natural resources, etc. It is here that the use of Internet brings new information resources and can open new communication channels for rural communicaties. It also offers a means for bridging the gaps between developed community and rural people by initiating dialogue, interaction, new alliances and through interpersonal networks and cross-sectoral links between organisations.

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17

Cruising the Net for Bibliography/ Full Text Information

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ABSTRACT

An extensive survey and critical evaluation of current awareness, bibliographic and full text information sources on Internet have been carried out. A proper documentation of these sources, available freely on web will help the librarians/information scientists to utilise the available budgetary and manpower resources in a judicious and efficient manner. The libraries can utilise the precious resources thus saved elsewhere in a more fruitful way.

1. INTRODUCTION

Internet has become a powerful tool for information seekers in 21st century and has brought about unprecedented changes in the way information is searched and retrieved. Any information ranging from entertainment to highly technical can be searched and retrieved through the web.

An Attempt has been made in this paper to document the prominent sites on bibliographic/full text information in different subject areas available on the Internet sites. There are innumerable sites containing information . The websites of popular publishers and some prominent databases from which one can get valuable information free of cost have also been considered for inclusion in the paper. The emphasis is on the websites of prominent

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publishers, aggregators, current awareness services, the bibliographic resources and full text journals. Third party aggregators and subscription agents providing access to a number of electronic journals have also been included. Subject-wise analysis of a number of resources has also been attempted. An attempt has been made to identify and list the sites, and also analyse the cost implications and modes of accessing the of information.

2. INTERNET AND INFORMATION

The most dramatic development of the 1990s has been the rapid growth of Internet, and especially the World Wide Web that makes statistics outdated by the time they are collected. The web has made digital information a part of life for millions across the globe. It has provided an alternative for the kinds of databases that were previously found only on traditional online systems, OPACS or CD-ROMs.

For years publishers have been providing full-text access to a number of journals on CD-ROM, which required a significant amount of hardware, time and technical expertise on the subscriber's end. Information providers are now rushing to put their products on the web because of the ease of use and universal acceptance of web technology. The enhanced features of online journal access provided through web technology such as hyperlinks to related texts and links to multimedia also provide value-addition to these sources. Electronic resources are finally coming of age as are the results of the explosion of Internet use, particularly World Wide Web technology. The prominent information resources are the bibliographic sources and full text electronic journals.

Although the Internet has long been a medium for electronic journals, mainstream publishers are now beginning to embrace the Internet, particularly WWW technology as a ubiquitous way to offer their publications to the international community. However, there are many areas still in their infancy including clear and understandable pricing algorithms, page layouts, copyright issues, backfile availability, guaranteed accessibility and other related issues. These issues are still open for debate.

As digital electronic materials offer reduced production costs

and more sophisticated methods of use. so do the interests of publishers and libraries and librarians can be seen to converge. Electronic materials can be sorted. transmitted and retrieved easily and quickly. These can be linked and made more interactive with cheaper access than with printed materials. New library buildings can be avoided and the ideal of library cooperation may be realised. Typical examples of this trend are the applications of Internet to WWW publishing and access to online information.

3. RESOURCES ON THE WEB

The range of information resources available can be broadly categorised as current awareness services, bibliographical services or full text electronic journals.

3.1. Current Awareness

Automated Contents Page Services are based on the delivery of contents pages of one or a range of journals each time they are updated. Journal contents can be easily included as a feature of mediated services. A number of such services are now available on Internet, either based on general current awareness databases while others are direct from individual journal publishers. As new journal articles/books/book chapters/websites are published, current awareness profiles automatically notify the clientele. However current awareness profiles will not retrieve everything on the topic. One should be aware of the other databases and sources specific to one's field of interest. Examples include:

- **UNCOVER REVEAL** (http://uncweb.carl.org)
  - the user can select the journal(s) required and indicate the E-mail address for automated delivery as and when they are published
  - costs $25/per year to maintain a profile.
- **BLACKWELLS INSIDE** (http://inside.bl.uk)
  - Updated daily/weekly/monthly
  - Subject coverage: general
  - Keyword search and table of contents alerts
  - Accesses more than 20,000 journals and 16,000 conference proceedings from 1993onwards
  - Abstracts provided for 1000 journals

- Fee-based

- **CATCHWORD** (http://clorinda .catchword.com)
  - Provides table of contents from journals accessible via catchword
  - E-mails are sent whenever new journal issue is received
  - Subject coverage: General
- **EMERALD** (http://pikerton.emeraldinsight.com)
  - Provides tables of contents from the 100 journals accessible *via* Emerald
  - E-mails are sent whenever a new journal issue is received
  - Abstracts are not commonly available
  - Links to the fulltext of the articles is provided within the E-mail
  - Subject coverage: Management, Accounting, Auditing, Marketing, Human Resource Management, and Library Science
- **ELSEVIER** (www.elsevier.nl/homepage/alert/?mode=direct)
  - Provides tables of contents for selected journal titles
  - Subject coverage: main focus is on social sciences, science/technology
- **IDEAL ALERT FROM ACADEMIC PRESS** (http: www.europe.idealibrary.com)
- **OXFORD JOURNALS** (http://www3.oup.co.uk/inls/tocmail)
  - Provides tables of contents for approximately 150 OUP journals
  - Subject coverage; broad range of subjects.
- **INGENTA** (http://www.ingenta.com)
  - Provides tables of contents from 18000 journal titles
  - Updated weekly
  - Very few abstracts are available
  - Subject coverage: generic
  - Fee-based
- **OVID** (http://web.ovid.unilinc.edu.au)

- Provides tables of contents
- Includes abstracts
- Available free of cost
- Subject coverage: Agriculture, Biology, Education, Engineering, Health, Human Movement, Sciences, Sports Science

❑ **SYNERGY** (http://www.blackwell-synergy.com/journals/default.asp)

- Provides tables of contents for the Blackwell Science and Munksgaard journals
- E-mails are sent whenever a new journal issue is received
- Subject coverage: generic

❑ **CSIRO JOURNALS EARLY ALERT SERVICE** (http://www.publish.csiro.au/journals/earlyalert.html)

- Provides table of contents for 14 selected journals
- Subject coverage: Agriculture, Botany, Biology, Biomedical Sciences, Chemistry Physics, Soil Science, Water Research

❑ **SPRINGER LINK ALERT** (http://link.springer.de/alert/)

- Provides tables of contents (and abstracts) for selected journal titles
- Links to fulltext are provided, where a print subscription is held
- Subject areas: Chemistry, Computer Science, Economics, Engineering, Environment, Forensic Science, Geo-Sciences, Law, Life Sciences, Mathematics, Medicine

3.2. Bibliographic Services

There are innumerable Science and Technology databases available on the Internet, and it is difficult to list all of them. Important databases in the field of Physical, Chemical, Mathematical and Biological Sciences have been included. The patent databases available on the Web have also been included. URLs of publishers mentioned in this article also provide reference to these databases

❑ **INDMED (http://indmed.nic.in)**

- Developed with the joint efforts of Indian Council of

Medical Research (ICMR) and National Informatics Centre(NIC), New Delhi

- Provides bibliographic information from 75 Indian biomedical journals many of them not covered by international databases

❑ **MEDLINE (http://www.nlm.nih.gov)**

Medline was provided free of charge by National Library of Medicine (NLM) from 1997 onwards. Medline includes bibliographic records of articles from over 4300 biomedical journals. INTERNET GRATEFUL MED (IGM) was introduced by NLM after several years of development of the Unified Medical Language System (UMLS). With UMLS, NLM developed a meta-thesaurus. UMLS allows the searchers to use the terms familiar to them for a subject, and the sytem translates the searchers' terms in the process of executing the search. Handling terms used synonymously is one example of how meta-thesaurus works. PUBMED, a service of the NLM provides access to over 11 millions Medline citations back to mid-1960 and additional life science journals. Pubmed Central is NLM's free and unrestricted online archive of journal articles.Links to full text in PUBMED Central are available from PUBMED citations.

❑ **EMBASE (http://www.embase.com)**

It provides access to high quality, current and validated biomedical and pharmacological information.With more than 13 million records drawn from the international literature, embase.com contains the entire EMBASE databases plus unique MEDLINE records back to 1966. It is available on fee basis. One can use this database with approx 30,000 records free of cost.

❑ **ERIC (http://www.askeric.org/eric/ freely)**

Education Resource Information Centre (ERIC) is the world's largest source of education information with more than 1 million abstracts of documents and journal articles on education research and practice. It provides access to ERIC document citations from 1966.This database is updated on monthly basis. Abstracts of journal articles are available on this site free of cost. Full text of the document is available on charge basis only.

❑ **PATENTS DATABASES**

- ***United State Patent and Trademark Office*** (http://www.uspto.gov)

It contains two separate databases (*i*) for granted patents (full text since 1976, full page images since 1790) and (*ii*) for Patent applications (published since 15th march 2001). Information about US Patents is in two forms. Patents issued between 1790 and 1976 are searchable only by patent number and current US classification. One can access the information about required US patents using any one of the three options, *i.e.* Quick Search, Advanced Search and Patent number Search. Full text as well as abstract of the patents can be downloaded from this site free of cost.

- ***Corporate Intelligence*** (http://www.trademarks.com/contact.htm)

It can provide copies of any of the over 6 million US patents that have been issued since 1790. Copies can be printed, mailed or downloaded in a variety of formats. Full text information about US patents is available from 1945 onwards. Full text as well as abstract of the patents can also be downloaded from this site free of cost.

- ***European Patents*** (http://gb.espacenet.com)

This is the site for searching of European patents through a number of search options such as simple text, company name as well as through patent number. One can get the bibliographic information along with claim free of cost.

❑ **DATABASES ON CHEMICAL INFORMATION**

- ***CAS Databases*** (http://www.cas.org/)

Chemical Abstracts Service(CAS) is the producer of the world's largest and most comprehensive databases on chemical information. Its principal databases *i.e.* Chemical Abstracts(CA), and Registry include about 16 million document records and 30 million substance records respectively. It can be searched through a number of options available on this site including Sci Finder. Scientific & Technical Network (STN), on Web, STN Easy, CA Select on the Web and Chemport. User ID and password are required for access. Information is available only on charge basis.

- ***ChemPort*** (http://www.chemport.org/)

Scientists can access full text documents from key scientific publishers and patent offices through the options already mentioned in CAS Databases.

Some other prominent databases available through Internet include:

- AMERICAN CHEMICAL SOCIETY
  http://pubs.acs.org
- CHEMWEB.COM
  http://www.chemweb.com
- CHEMCENTER
  http://www.chemcenter.org
- CHEMCONNECT
  http://www.chemconnect.com
- ROYAL SOCIETY OF CHEMISTRY
  http://www.rsc.org/is/journals/current/ejs.htm

❑ **DATABASES AVAILABLE ON PHYSICS**

- **INSPEC** (Information Service In Physics, Electronics, Computer & Control Technology) (http://www.ieee.org/)

The website of The Institution of Electrical Engineers(IEEE) provides access to bibliographic/full text information available on INSPEC data base. This is a fee-based database. User ID and password are required for access.

- **AJT/TPT Database**(http://www.phy.nau.edu/~danmac/AAPTDB/)

It is an electronic database indexing all word/name in every article title, author's address and every word in author's supplied abstracts (where available) for articles appearing in the American Journal of Physics (AJP) and The Physics Teacher (TPT) from issues published between Jan 1990 and Oct 1998. Using this Web interface, one can electronically search these journal articles by topic, author or address, and read and print the retrieved abstracts. Complete original articles must be retrieved from the printed or microfiched journals available from most university libraries, or from the American Institute of Physics.

❑ DATABASES IN THE FIELD OF ENGINEERING

• IEEEXPLORE (http://ieeexplore.ieee.org/)

It provides full text access to IEEE transactions, journals, magazines and conference proceedings published since 1988. Access to tables of contents of IEEE transactions, journals, magazines, conference proceeding is available free of cost. But only IEEE Members can search and access all IEEE abstracts/ citation records and articles free of cost. Active Web account has to be maintained to access these services.

• Engineering Village 2 (http://www.ei.org/engineeringvillage2)

Over 5 million abstracts on Engineering from COMPENDEX and a variety of engineering databases and information sources can be searched and retrieved. This service is available on payment basis.

• ADINA Ei Compendex (http://www.edina.eu.ac.uk/compendex/ about.html)

It is produced by Engineering Information Inc. and is the most comprehensive inter-disciplinary engineering information database in the world, with over 5 million summaries of journal articles and conference proceedings from 1970 to date with 220,000 new additions every year. It is available on fee basis and requires user ID and password.

❑ DATABASES ON MATHEMATICAL SCIENCES

• Zentralblatt MATH – Database (http://www.zblmath.fiz-karlsrube.de/MATH/)

It is the world's most comprehensive and longest running abstracting and reviewing service in pure and applied mathematics. The Math database contains more than 1.8 million entries drawn from more than 3000 serials and journals. The coverage is from 1931.

• Clay Mathematics Institute

The site provides references as well as full text in PDF format related to Mathematics free of cost. The primary objectives and purposes of this institute are:

- To increase and disseminate mathematical knowledge.
- To educate mathematicians and other scientists about new

discoveries in the field of Mathematics.

- To recognise extraordinary achievements and advances in mathematical research..

3.3. Full Text Journals

Characterised by an abundance of experimentation and few standards, the current market of full text journals includes commercial and non-commercial offerings from a wide-range of publishers, aggregators, groups and individuals. Some prominent examples are:

3.3.1. Publishers from Commercial, University and Scholarly Society Sectors

Some of the larger or more progressive publishers have decided to offer their journals through the Internet directly by themselves. This offers the opportunity for the total control, value added features and no intermediaries. Prominent examples include:

- *H.W. Wilson Electronic Collection* provides text of more than 1,400 periodicals. It contains page images from more than 1,090 periodicals. Biography databases cover more than 195,000 names. Wilson web databases include PDF page images for many of the periodicals covered.
- *Academic Press IDEAL (http://www.idealibrary.com)* is a project of Academic Press to offer 176 journals on the Internet using Web technology. It is the outcome of partnership among Academic Press, Fujitsu, Bath University (U.K.) and several other publishers including the Institute of Physics and the Royal Society of Chemistry. Tables of contents and searching of abstracts are free.
- *HighWire Press: (http://highwire.stanford.edu)* is a collaborative project between Stanford University Libraries and Academic Information Resources (SUL/AIR). The project is unique in that it is a partnership in the scholarly community bringing together faculty scientists, librarians, technology experts and students. Unique features of the project are: that the titles are full text searchable on the web, that they offer link footnotes to other databases and relevant information on the web, and that the links within an article to citations in other databases are sometimes provided. For example, with Medline, E-mail links to authors are offered so that readers

can send E-mail directly.

- *Elsevier Press (http://www.elsevier.com)* An inventory of 1,100 titles is available in electronic format. Elsevier Electronic Service (EES) will allow an organisation to license and locally load all or some of the Elsevier titles on a local server with that site being responsible for hardware, software and archiving function.
- *Science Direct: (http://www.sciencedirect.com)* Elsevier puts all its journals on the Web and users may pay for access to the electronic project using Orion Scientific's Science Server software. Users pay for individual articles.
- *Wiley Interscience (http://www3.interscience.wiley.com)*
- *Project Muse: (http://muse.jhu.edu)* is a collaborative project of the Johns Hopkins University Press and the Milton S. Eisenhower Library, to offer worldwide electronic access to full text of over 40 journals published by the Press. Pricing for their electronic titles is scaled in terms of a single academic campus, for special libraries, for consortia, for small groups of IPS (>25), and for individuals. For example a single academic campus can gain electronic access for all 40 titles for around $2500 with substantial discounts (60%)then being available for print if desired
- *The Mit Press: (http://mitpress.mit.edu)* this is the preferred, no additional cost option for obtaining direct electronic access to the journals available on this site.
- *Springer-Overflag Link Service (http://springer.co.uk)*

  Offers 400 STM journals *via* their LINK electronic service. They have plans for value-added features *e.g.* addition of multi-media to articles
- *SIAM (Society for Industrial & Applied MATHEMATICS) Journals Online:*

  Eleven journals are available online. Electronic access is free with print subscription.
- *ACM Digital Library*: ACM Digital Library is a comprehensive collection of over 20 ACM Publications Online, including a fifteen year archive of journals, and a nine year archive of ACM conference proceedings – equal to more than 2,50,000 pages of text.

3.3.2 Third Party Agregators and Subscription Agents:

A variety of companies have committed to aggregating under a single umbrella a large number of electronic journals from a wide variety of publishers. In some cases (e.g. OCLC, ECO, and ISI) the journals will be centrally loaded and offered through a common interface with consistent searching and archiving. In other cases (e.g. Blackwells EJN) companies will load only abstract and citation information but provide a common gateway to a wide variety of publishers.

- BLACKWELL'S ELECTRONIC JOURNAL NAVIGATOR (http:/ /www.blackwell.co.uk)

  It is designed to offer a single point of access, reference, control and financial management for a library's electronic journal subscription. Blackwell's is not loading or archiving electronic journals but is providing an interface to many different titles with different publishers in the Internet and is acting as a full service subscription agent for centralized ordering, consolidating invoicing and a central point for administration.

- JSTOR PROJECT (http://www.jstor.org)

  Funded by Melon Foundation, JSTOR provides an online archive to pre-1990 issues of a number of core scholarly journals in the field of economics and history.

- SWETSNet (http://www.swetsnet.nl)

  This service includes titles from a large number of publishers including: Blackwell Science Ltd. Kluwer Academic Publishers, MCB University Press Ltd., Springer-Verlag, Carfax Publishing Ltd., Taylor&Francis Ltd. More than 200 of the available full-text titles covering engineering and technology are provided.

- EBSCO Online (http://www.ebsco.com)

  There are four main divisions:

  (*i*) Subscription

  (*ii*) EBSCOPublishing – producer of databases

  (*iii*)EBSCO host- Online system for bibliographic and full text database searches

  (*iv*) EBSCOdoc – Document Delivery.

- LEXIS/NEXIS (http://www.lexis-nexis.com)

  Lexis/Nexis provides full-text news and business and political information sources.

- FAXON E-Journal Services (http://faxon.com/subserr/ejse.htm)

  faxon.com provides a wide range of services that help to identify, acquire and manage the electronic journal collections. These services range from expert help on licensing and registration issues, and e-journal set-up to a sophisticated research, access and retrieval product that connects information seekers to electronic content.

- OCLC Electronic Collections Online (http://www.oclc.org/oclc/menu/eco.htm)

  It gives integrated access to e-journals from numerous publishers such as Adis International, Blackwell Science, Institute of Mechanical Engineering, etc. One common user interface is provided with links from OCLC indexes to ECO titles and Z39.50 links to local OPACS. OCLC provides long term archiving and perpetual access to "subscribed-to-portion of journals"

- Institute for Scientific Information (ISI) (Http://www.isinet.com)

  ISI sponsores the "Web of Science Project" Which has a Web based interface to citation indexes with document delivery and Z39.50 links to holdings, and partnering with publishers to add links to full text journals.

- OVID Technologies, Inc. (http://www.ovid.com)

  It is a full text and indexing and abstracting service.

- Ingenta journals (http://www.ingenta.com)

  The website gives free access to a searchable database of journals from over 30 publishers including Academic press, Arnold, Blackwell Publishers, Portland press, Gordon & Breach Publishing and Blackwell Science. Subscribers of this service have unlimited access to the full text of titles to which their institutions subscribe in print. Subscribers and non-subscribers can also purchase articles from non-subscribed journals.

3.3.3 Non-commercial Web Sites Offering Access to E-journals

- ARL DIRECTORY OF ELECTRONIC JOURNALS AND NEWSLETTERS (http://www.arl.org/scomm/edir).
- CIC E-JOURNALS COLLECTION
- AUSTRALIAN JOURNALS (NATIONAL LIBRARY OF AUSTRALIA)
- SERIALS IN CYBERSPACE
- CANADIAN ELECTRONIC SCHOLARLY NETWORK
- LIBRARY OF CONGRESS LISTS OF NEWSPAPERS AND PERIODICALS
- UNIVERSITY OF PENNSYLVANIA LIBRARY ELECTRONIC JOURNAL LISTINGS
- BUBL Information Service (http://bubl.ac.uk)

  The BUBL (Bulletin Board for Libraries) electronic journal section provides a selected listing of e-journals along with a directory of directories on e-journals and other related information.

4. SUBJECTWISE EVALUATION OF RESOURCES

4.1 Agriculture

Many of the databases can now be searched on the World Wide Web. Web access to these databases may slow down because of connectivity problems and simultaneous use by a large number of users. However, one advantage of Web access is that the database hosts appear to realise that the means of searching should be as simple as possible and generally provide a default form for searching. Some prominent databases that can be searched online include:

- CAB Abstracts
- AGRICOLA
- AGRIS Corporation (http://www.agris.com)
- AGRISEARCH
- BIOLOGICAL & AGRICULTURAL INDEX
- FOOD SCIENCE & TECHNOLOGY ABSTRACTS (FSTA) (http://www.silverplatter.com/catalog.fsta.htm) Coverage: 1969 to present

4.2 Earth Sciences

Looking for earth science information on the Internet can be especially challenging, but very rewarding as well. Many government agencies, research centres, academic departments and lay enthusiasts maintain high quality, timely Web pages. Locating the information however can be very frustrating if one does not know the URL.

Earth Science Web Sites and search Engines

S. No.	Title	URL	Producer/Publisher	Content
1.	Common Information Service System	http://outside.cds.gov.8000/ciss	National Institute of Occupationalsafety & Health	Bibliographic -full text
2.	Earth observation	http://www.eoc.nasda.go.jp	National Space Dev. Agency of Japan	Data, Full-Text
3.	Earth observing Systems Data &	http://www.voims.gsfc.nsa.gov	National aeronautica & Space Admin.	Data
4.	Fedworld	http://www.fedworld.gov	National Technical Information Service	Bibliographic
5.	Geopatial Data Clearing House	http://www.fgdc.gov/clearinghouse/	US Federal Geographial Data	Data, Bibliographic
6.	Gicros, giss Index Climater Resource & other Stuff	http://www.giss.nasa.gov/gicors	Nasa/Goddard Institute for Sapce Studies	Web Links
7.	Global Change Data & Inf. System (GCDIS)	http://www.gcdis.usgerp.gov	Cooperative Agencies participating in the US Global Change Reserach Program	Data & Web Links
8.	Master Environ. Library	http://mel.dmso.mil	US Department of Defence	Data
9.	Nasa Technical	http://techreports.larc.nasa.gov cgi-bin ntrs	National Aeronautics and Space Administration	Bibliographic
10.	National Climatic Data Centre	http: www.ncdc.nsaa.gov	National Oceanographic & Atmospheric Adm.	Data

11.	National Inf. Service for Earthquake Eng	http://nisee.ce. berkeley.edu	Sponsored by National Science Foundation	Biblio graphic and Data
12.	NOAA Environmental Services Data Directory	http://www.esdim.noaa.gov/nosaa-catalog/index.html	National Oceanographic & Atmospheric Administraion	Data
13.	NOAA Server	http://www.uwin.siu.edu/databases/wrsic/index.html	National Oceanographic & Atmospheric Administration	Data Some Bibliographic
14.	USGS wrsic Research Abstracts	http://www.uwin.siu.edu/databases/srsic/index.html	Water Resources Scientific Inf. Centre of us Geoglogic Survey	Bibliographic
15.	World Data Center for Marine Geology	http://www.ngdc.noaa.gov/mgg/aboutimgg/wdcamgg.html	National Oceanographic & Atmospheric Administration	Data

4.3 Physics

Please see the databases under 'Full text/Bibliographic Databases'.

4.4 Chemistry

Along with database listed under 'Full text/Bibliographic Databases' the following sites also may be seen.

- LINKS FOR CHEMISTS (http://www.liv.ac.uk/Chemistry/Links/links.html.)

  Over 5300 links are maintained at the University of Liverpool's Department of Chemistry, arranged in about 35 categories. Links to about 290 electronic journals from 30 publishers and many independently published sources are also included.

- CHEMINFO-Chemical information sources (http://www.indiana.edu/~cheminfo/)

  Selected Internet Resources for Chemistry and other items are included in the website

- CHEMDEX http://www.shef.ac.uk/chemistry/chemdex/

It is maintained by Mark Winter, University of Sheffield. In early 1999, it contained 3700 links including lists of universities, government labs, and companies, with the sites categorised by 20 chemical sub-disciplines, databases, journals and so on.

- ACS PUBLICATIONS/ESSENTIAL RESOURCES FOR THE CHEMICAL SCIENCES http://pubs.acs.org/ Twenty American Chemical Society journals are available through this service, including the following engineering-related titles: Biotechnology Progress (co-published with the American Institute of Chemical Engineers), Chemical Research in Toxicology, Chemical Reviews, Chemistry of Materials, Energy and Fuels, Industrial and Engineering Chemistry Research and Journal of Chemical and Engineering data. Browsing of authors and tables of contents is available, and individual titles can be searched using a simple forms interface. Articles are delivered in PDF.

4.5 Bio-sciences

- ELECTRONIC SITES OF LEADING BOTANY, PLANT BIOLOGY AND SCIENCE JOURNALS (http://www.e-journals.org/botany)

  These are links to journals in which articles concerning plant biology are published. The sites will almost always have a Table of Contents available freely and may frequently have selected articles or the entire text online. Some sites are free; others require registration or paid subscriptions. Many journals have trial period for browsing.

- BIOSIS(http://www.biosis.org)

  It is a complete collection of bibliographic references of life sciences journal literature published around the world from 1926 onwards. Life science topics include Agriculture, Agronomy, Biochemistry, Biotechnology, Environment, Genetics, Medicine, Microbiology and Pharmacology. On 15th March 2001, BIOSIS(www.biosis.org) and EBSCO Publishing(www.epnet.com) jointly announced the launch of Bibliographic abstracts *via* EBSCO host at Denver, Colorado.

4.6 Medicine

- MEDICAL JOURNALS AVAILABLE FREE OF COST (http://www.freemedicaljournals.com)

  Within the next two years, the full text of most important medical journals will be available online free of cost. The access to full scientific knowledge will have a major impact on medical practice and attract Internet visitors to these journals.

4.7 Engineering and Energy

Most engineering databases are available in several formats—online, on CD-ROM or via the Internet – and may be accessed from various hosts. There are many useful tools accessible over the Internet, a number of them being full text services and electronic journals. Some of the databases are listed here, apart from those mentioned under Bibliographic/Full Text Databases.

- SPIE'S INCITE DATABASE : (The International Society For Optical Engineering) (http://www.spie.org/incite)
- NTIS (http://www.fedworld.gov)

  NTIS database is produced by the US National Technical Information Service and consists of access to unrestricted US government sponsored research and development reports from Federal agencies. Many engineering and technological developments are covered by the 2.5 million references dating back from 1964.

- INTERNET ACCESS TO ENGINEERING E-JOURNALS

  Web access for selected full-text trade and industry newsletter e-journals

S.N	TITLE	URL
1	CHEMICAL PROCESSING	Http://www.chemicalprocessing.com/
2	CHEMICAL WEEK MAGAZINE	Http://www.chemweek.com/index.html
3	ELECTRICAL CONTRACTOR	Http://www.ecmag.com
4.	ELECTRONICS WEEKLY HYPERACTIVE	Http://www.electronicsweekly.co.uk
5.	ENERGY IN BUILDINGS AND INDUSTRY	Http:// .insidecom www.co.uk/eibi/
6	ESTATES GAZETTE INTERACTIVE	Http://www.egi.uk
7	INDUSTRIAL TECHNOLOGY	Http://www.industrialtechnology.co.uk.index.html
8	PLASTICS NEWS	Http://www.plasticsnews.com

9	WATER & WASTES DIGEST	Http://www.roadsbridges.com/
		wwdigest.html
10	BUILDER	Http://www.builderonline.com
11	CHEMICAL & ENGINEERING NEWS	Http://pubs.acs.org/cen/index.html
12	CHEMICAL ENGINEERING	Http://www.Che.com

4.8 Mathematical Sciences

The databases for Mathematical Sciences can be referred to the section, Bibliographic/Full text Databases.

5. ECONOMICS OF INFORMATION RESOURCES ON THE WEB

The shift away from printed materials to electronic materials; and from traditional patterns of ownership of resources to more reliance on external resources pose a number of questions, which need to be answered. It is now universally accepted that journals will have to be available in digital formats. However a number of issues dominate including:

- Quality of resources
- Publishing issues
- Free Vs. priced
- Are the resources freely available

5.1 Pricing

Perhaps one of the most uneven, confusing and frustrating phenomena facing publishers and subscribers is how to charge for electronic journals. Different publishers are adopting different mechanisms. The frustrating area for librarians and consumers is that these varying pricing algorithms often do not make sense or are unnecessarily linked to the print product, whether one wants to receive it or not. For example, some publishers are offering access to electronic journals at reduced costs as compared to the print version. They are also offering different subscription models for individuals, stand-alone libraries and consortia. The Institute of Physics, U.K. is offering free online access to electronic version of journals if one maintains a print subscription. Academic Press is offering its 176 titles to library consortia at 10% above the cost of the print rate. A number of publishers, associations and societies are offering free access to many of their electronic journals and permitting free downloading of articles from these sources. Some

varieties of pricing algorithms are:

- e-journal offered at 10%less than print subscription : combined print and e-journal costs only 30% more than print subscription (*e.g.* Project MUSE)
- e-journals free if print maintained (e.g. Institute of Physics)
- e-journals offered to consortia - collective price is 10% above print base held by consortia with full access to all titles to all members (*e.g.* Academic Press)

5.2 Security

The problem of offering full access to authorised subscribers and locking out unauthorised readers is another area of concern. Many publishers will let any viewer see certain elements of their e-journals such as sample issue, sample articles or table of contents. However full access to the complete publication requires authentication. The most common authentication method is issuing a password to the subscriber.

5.3 Copyright

Issues surrounding intellectual property rights and electronic media are especially confusing in the light of old copyright laws. Because images are electronically forwarded around the Internet, it becomes difficult to control and define what can be done and what cannot be done. Because libraries have a tradition of sharing individual journal articles between themselves through inter-library loan under fair use rules, it is important to review contracts for electronic journals to understand how the contract may alter the library's ability to participate in ILL for those titles from a particular publisher.

5.4 Backfile Availability

Libraries have traditionally played a very active role of acquiring and storing journals for long term use. Will older less used materials cease to be available online. Is it feasible and practical to store large electronic databases? In other words "Whose responsibility? And what guarantees?"

5.5 Reliability and Accessibility of Data

Traffic on the Internet is very irregular due to bandwidth limitation and data traffic volume to different networks and servers. This

can sometimes present serious problems when trying to access some servers on the net. For high use e-journals, it will make sense to distribute or mirror these titles in different servers on the net.

6. WEB EVALUATION CRITERIA

A survey of the electronic journal usage was conducted at Ohio State University and drawing upon numerous online guides, a checklist was developed of criteria for evaluation of web resources. These criteria take on more importance for Web resources because of differences between traditional print resources and Web resources. The criteria included were :

- *Authorship*
- *Currency*: Dates should be provided for each source, which are current or timely enough to be appropriate to the reserch paper topic. The resources should be updated regularly.
- *Perspective*: Biases and affiliations should be evident on the web resources, including commercial affiliations.
- *Peer review*: Web resources should go through some review process or be recommended by reliable outside sources.
- *Audience*: Intended audiences (laypersons, professionals, educators, etc.) should be evident.
- *Style and Tone*: Web resources should meet the same criteria for grammar, spelling and documentation that print resources meet. Sites should be user-friendly.
- *Quality of Information*: Content should be timely, documented, verifiable and accurate. Limitations should be pointed out. Information should be relevant to the topic.
- *Organisation*: Resources should be well organised, easy to follow and use with reliable links.
- *Stability of information*: Websites and information on them should be relatively stable over time as should the basic information. Changes in information (or updates) should be indicated.

7. CONCLUSION

Periodicals are the primary source of information widely used by researchers to carry out their researches and no single library can procure all periodicals/journals due to information explosion and budgetary constraints. The number of journal titles are increasing three-folds every 15 years and costs of journals are increasing two and half times every ten years. The number of peer-reviewed electronic journals increased by well over 570 times between 1991 and 2000. Price increases of journals in Science and Technology and medicine have averaged from 9-13% per year over the past decade. However, in view of the constraints being faced by libraries due to the cuts in library budgets, it has become impossible to procure each and every document for library. Internet now offers a solution wherein a number of journals are freely available on the net as in the case of US Patents for which full text information is freely available from 1790 onwards using USPTO and Corporate Intelligence sites (www.uspto.gov and www.tradmarks.com /contact.htm). BIOMEDNET an award winning site with over 100,000 members offering free access to "hundreds of full text publications in biology and medicine". Some articles and all the abstracts are free, the full text articles can be purchased online. Other sites are www.freemedine.com and www.olago.ac.nz/surgery/ijournals.html which provide the list of journals and full text information. Systematic documentation of such resources can help save lakhs of rupees in foreign exchange.

Information which is freely available on the net may be priced after some time as in the case of Derwent World Patent Index (DWPI) which is available on charge basis from June 2001. Medline (Website :www.nlm.nih.gov) and ERIC (Website: www.askeric.org/Eric) are the prominent databases available on the net which provide free access to bibliographic information and full text information on charge basis in medical and education field. This type of information is very costly on online databases available on online systems such as DIALOG and STN. It is also observed that table of contents are free upto five to ten years for back volumes on publisher's as well as individual websites of journals which do not require the password to use their sites.

Electronic journals offer tremendous possibilities for a transformation of the information chain, provided a number of

issues confronting the publishers, the libraries and the users are resolved.

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18

Digitised Information Services for Academic Libraries

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ABSTRACT

The success and survival of academic libraries in future will depends on their role to satisfy the ever-increasing information needs of users. The information explosion as well as the emerging modern information technology and at the same time complex information needs with change in character for access to information forces the academic libraries with their shrinking budgets to move from the traditional library services to digitised information services for provision of faster, and easier access to information. The advent of the modern information technology leads the libraries to transform from store house of books and documents to dynamic information centres for providing digitised information services. The resources of information available in the form of digital format becomes a dynamic resource for global sharing more easily than the knowledge in any form and lends scope for automated delivery mechanism. This paper focuses the need for the practice of digitisation and digitised information services at academic libraries to create digital library service environment. Discusses the objectives and services of digital library. It concludes that in view of the effectiveness of digitised information services, urges that the academic libraries should go in for digitised information services for their survival in future.

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1. INTRODUCTION

The information explosion, shrinking budgets, rising costs of information resources and the ever- increasing expectations of user community have made the traditional libraries to face a difficulty in providing satisfactory or optimum service to the users.The advent of information on Technology leads the academic libraries to transform from store house of documents to dynamic information centre by adopting information technology.The Information Technology provides an opportunity to overcome the difficulties faced by the traditional libraries in providing effective service."At present information is not only recorded items of knowledge, it is also the digitised bits of information that could be moved through computers and telephone lines to wherever it is needed".[1]The success and survival of Academic libraries in this new information age depend on their role to satisfy the complex information needs of the academic community. This can be achieved by adopting new models of resource management, integrated information technology in library operations and services."The technological advances in computers, telecommunications, optical technology and storage devices have brought about on a new era in the information age resulting both in the emergence of network of networks to facilitate the world wide transfer of electronic information and the proliferation of digital data for easy access and transfer".[2] The vast innovations in modern information technology make the academic libraries to accept for establishing "digital library service environment – that is, a networked online information space in which users can discover, locate, acquire access to and, increasingly, use information".[3]The digital library technology plays a major role to make the flow of information from the point of origin to the location of its use continuous, easier and more quicker.The academic libraries need to establish digital library service environment for digitised information services because the services of academic libraries on traditional lines are either out dated or time consuming to retrieve, in meeting the information needs of academic community.

2. ACADEMIC LIBRARIES

Academic libraries exist to serve the information needs of academic community in the matters of reading, study and

research. The quality of academic input directly based on the services of the academic libraries.New challenges for Academic libraries are emerging due to information explosion, rising inflation rates, insufficient funds and complex information needs. These factors have hindered the development of academic libraries in general and development, organisation and provision of service in particular.The explosion of electronic methods in every field provides new and exciting opportunities for academic libraries to develop digitised information access facility to the academic community.The digital media is much quicker than the printed media. "Accessing the other library's collection rather than possessing almost all documents on a given subject is the opportunity that the electronic media has provided to the academic libraries through networking".[4]The Academic libraries have to take best advantage from the increasing advancements in storage media, computers and telecommunications to create digital library service environment for their survival and quality service in future.

3. DEFINITIONS OF DIGITAL LIBRARY

There is no consistent worldwide agreement on the definition of a digital library "There are many descriptions, definitions and varieties of digital libraries. The size of files, the format of content housed, and the access restrictions (or lack of restrictions) are some of software contained on a CD-ROM is described as a digital library as well. A series of digital audio or video clips or full-length movies can also be thought of as digital libraries".[5]The terms Digital library, Electronic library and virtual library are being used synonymously. "Some useful distinctions have recently been made:

3.1 Electronic Library : A library that provides collection and/ or services in electronic form, for example, optical video disk (which is not digital), CD-ROM, on-line etc.

3.2 Digital Library: A library that provides collections and/or services in digital form.

3.3 Virtual Library: A library that does not physically exist, most often used to denote a library with distributed collections or services that appear and act as one. Typical example is a web site with pointers and like to other sites."[6] The term digital

library appears to encompass both electronic and virtual libraries."The digital library is an Electronic library in which a large number of geographically distributed users access the contents of large and diverse repositories of electronic objects using computer networks.Yarkey defines Digital library as electronic library in which large number of users across the world can access information in the form of Networked Electronic texts, images, maps, sounds, videos, catalogues, Government publications, hypertext, hypermedia and multimedia compositions etc".[7] Larson defines that the digital library is a virtual library – the library of thousands of networked electronic libraries.

4. OBJECTIVES OF DIGITAL LIBRARY

"The main objectives of Digital library are:

To capture, store, manipulate, and distribute information.

To introduce and provide new services

To provide need-based and retrospective search services to the user.

To have large number of data bases in CDs.

To avoid routine and redundant activities.

To provide facility for networking and resource sharing.

To access national and international journals which are being published only in machine readable form.

To digitize the documents for preservation and for space saving.

To support library functions such as circulation, serial control, Acquisition control, stock maintenance and other routine office works and developing in-house data base.

To improve the cost effectiveness of library operations [9]

5. DIGITAL RESOURCES

The success of digitised information service depends on the nature, content and quality of Digital Resources.

"Digital resources can broadly be grouped into two categories – those that are originally created and distributed in digital format and those that are originally crated in another

format and are later converted into a digital format through a process generally referred to as digisation".[10] The primary method of building Digital resources is digitization. Digitisation refers to the process of converting an item such as printed text, manuscript, image, or sound, recording, picture or video into digital form. An image of a physical object created with a scanner or digital camera and converted to digital format for use through computer. The Digital cameras and scanners may both be used to capture the digital image. Another technology involved in Digitisation is optical character Recognition or OCR. The purpose of the whole OCR process is to recognise the letters, words, and symbols printed on a page. Digitisation solves the traditional library problems such as conservation, preservation, storage space, multimedia documents and remote access to information collections. One of the greatest benefit of digital resources is that, users can access the resources themselves.

6. DIGITISED INFORMATION SERVICES

Rapid growth of the information technologies has opened up an entirely new medium for providing improved information services and resources for the users. Due to the enormous information explosion and technological changes, the traditional libraries find it difficult to provide effective service. The digitised information services overcome these difficulties.

The following are some of the major digital library services.

(*i*) The service of union catalogue enables the users to locate information about their required documents available in different libraries through the network. Online catalogue service can be made available through interval web.

(*ii*) The document supply delivery services enable a library to request another library for a copy of a document to be transmitted through E-mail or fax.

(*iii*) Inter library loan service enables a library to request another library through the network for books required by its users on inter-library loan basis. Success of this service depends on the cooperative spirit of the participating libraries.

(*iv*) Referral services enable to satisfy the users by referring them to the source to be approached to get their required information.

(*v*) Electronic mail is an important communication based service. It enables participants in the network to transfer or receive information from any part of the world by using data networks. E-mail also facilitates other services like Inter-library loan requests, location search in the union catalogue, Document delivery, request transmission. Referral service and academic communication etc.

(*vi*) Bulletin board service enables a library to provide facility to display/view news, announcements etc. Several bulletin boards available in the network for each specific category of user discipline.

(*vii*) Current awareness service enable a library to put its list of latest additions into the internal web for usr attention.

(*viii*) Selective dissemination information service enables a library to attend the user requests through E-mail. The descriptions are matched against latest available documents and the required users are contacted through E-mail.

7. CONCLUSION

Academic libraries exist to serve the information needs of academic community for their academic matters. The success and survival of academic libraries depends on their role to meet the information needs of academic community. Academic libraries with traditional practices to serve the users have failed in meeting the complex information needs of the users due to the shrinking budgets and information explosion. To overcome this, the academic libraries need to create digitised information services with the use of modern information technology. The digitised information service enable academic libraries to provide faster and easier access to the information at the right time. The academic libraries, if they are to survive and succeed in future, have to change their role from traditional nature of services to digitised information services for meeting the changing information needs of the users.

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19

Access to Electronic or Digitised Sources: Metadata as a Tool

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ABSTRACT

The paper addresses the issues of information access in the digital envoirnment. It discusses the need for creating Metadata to ensure a well organised retrieval system for digitised sources. The paper deals with issues related to location and access, indexing techniques, various aspects of Metadata as a tool for location and access.

1. INTRODUCTION

For centuries libraries have addressed issues of information access, storage and retrival and have developed tools that are effective in handling traditional materials. However, any discussion on the future of tradtional tools should take into consideration the characteristics of electronic or digitalised sources especially networked resources and the possible nature of access to and retrival of these sources. The traditional library resources either in manual catalogue or in OPAC have distinct features. They are by and large homogeneous, at least in terms of content organisation and format of presentation, if not in interface design. They are standardized in their construction by using certain tools like AACR2 / MARC, LCSH,. LCC, DDC etc. and there is a level of consistency among them. Majority of the traditional library materials, typically demonstrate the following characteristics[1]:

- tangible (they represent physical items)

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- welldefined (they can be easily defined and categorised in terms of specific types. like books, journals, maps, sound recordings etc.)
- self-contained (they are packaged in recognisable units)
- relatively stable (though subject to physical deterioration, they are not volatile).

Electronic resources on the Internet, on the other hand in contrast to traditional library materials, are often:

- amorphous
- ill-defined
- not self-contained
- unstable
- volatile

Standards and procedures for organising library materials have been developed and tested by the librarians over the years. As a convention, trained cataloguers and indexers were made fully responsible for providing metadata through cataloging and indexing. Standards also have been developed to describe and access electronic resources including internet resources or resources on Web. If we want these standards to be successful we have to see that best practices will have to become standards and the standards will have to continue to evolve just like MARC has. Further they have to be adopted. It is only when the standards are adopted that the systems will be developed to support the wide-spread use. To achieve the best and broadest possible access to the digital or electronic resources we need to develop standards and systems[2].

The present paper examines the meaning, types, components, functions and standards of metadata. It discusses in detail about Dublin Core metadata standards as a tool facilitating best access to the information sources on Internet. It also tries to focus some light on the merits and limitations in using this standard. It also examines the role of libraries in making metadata standards fool proof and comprehensive.

2. ISSUES ASSOCIATED WITH CATALOGING OF ELECTRONIC RESOURCES

Following are the important issues to be considered while

cataloguing or indexing electronic resources using metadata:

(*i*) Defining the boundaries of electronic documents. Deciding the boundaries of electronic document is difficult. Take for example, if we want to catalgoue a website, the problem before the cataloguer is whether to catalogue the website itself or to include documents attached by hyper links.

(*ii*) Describing electronic documents with present variations. An electronic document stored remotely can change depending on the software used to display it.

(*iii*) Describing electronic documents that change overtime. As pointed out by Delsey (1983)[3] applying snapshot approach to electronic documents that may not leave any hint about when changes have occurred and how the content has altered is difficult.

(*iv*) Another issue yet to be resolved is whether all remote access electronic sources should be considered published.

3. METADATA

Metadata is a word of recent origin. The term Metadata was coined by Jock E Mayers in 1969. It is very frequently used by the electronic world. It is data about data. Just like, standard bibliographic information, summaries, indexing terms and abstracts, it is also a kind of surrogate for the original material. It describes the attributes and contents of an original document or work.

The DESIRE project[4] describes metadata as "data associated with objects which relieves their potential users of having to hae full advance knowledge of their existence and knowledge." Generally, the term 'metadata' is applied to electronic sources and refers to 'data' in the broadest sense—data sets, textual information, graphics, music and anything else that is likely to appear electronically.

Indexing of electronic documents using metadata, typically includes general description of the object using free text and values from controlled vocabularies. This consist of:

- Administrative metadata – information about rights, authorship, ownership.
- Structured metadata—used by viewing software.

- Content metadata—description, title etc.

Meta-information available in the form of metadata has two main functions:

- To provide a means to discover that the data set exists and how it might be obtained or accessed, and
- To document the content, quality and features of a data set, indicating its fitness for use.

The first of these functions aims at 'resource discovery' and the second targets 'resources description'. Besides meta information, the concept of metadata also includes an area called 'data labelling'. Data labelling uses tags to characterise the content of fields. Almost all the marking languages like SGML, HTML and XML make use of this kind of metadata. It has the advantage of simplicity, machine and human readability and great expressive power.

Metadata is important for both authors and seekers of electronic information. Used effectively, it makes information accessible by labelling its contents consistently. It leaves a pathway for users to follow to find the information they need – all in one place. This is even more important in invisible cyberspace which does not have shelves to browse. Without some sort of aid like 'metadata' it is not possible for effective browsing of the millions of documents sitting on thousands of servers around the world.

4. METADATA STANDARDS

Several metadata formats and syntax standards have been created and are in use throughout the world. Similar to AACRZ or USMARC, these standards govern the choice of data elements, the syntax (structure) of how their values are constructed, and the use of controlled vocabularies or limits to the values. They include Dublin Core, Encoded Archival Description (EAD) and Text Encoding Initiative (TEI). Though they use similar concepts, these schemes have different terms, syntax, and rules for assigning values. The main goals of metadata creators are:

(*i*) simplicity of creation and maintenance

(*ii*) commonly understood semantics

(*iii*) conformance to existing and emerging standards

(*iv*) international scope and applicability

(*v*) extendability

(*vi*) inter operability among collections and indexing systems

Selection of standards for creating metadata depends on various factors :

(*i*) the type of materials that are being described and digitised.

(*ii*) the purpose of the digitisation project, *viz.* access or preservation or both.

(*iii*) the user community.

(*iv*) the knowledge and expertise of project staff.

(*v*) the technical infrastructure of the institution

Among different standards available, the choice of metadata creator will be for a popular and persistent standard that offers intercoperability with other metadata databases and that is simple enough for public use. Dublin Core metadata standards (DC) is one such standard which became more popular in the developmental activities of web based searching and retrival mechanisms.

5. DUBLIN CORE METADATA OF STANDARDS

Each Dublin Core element is defined using a set of ten attributes from the ISO/IEC 11179 [ISO 11179] standard for the description of data elements. These include:

Name – The label assigned to the data element

Indentifier – The unique identifer assigned to the data element

Version – The version of the data element

Registration Authority – The entity authorised to register the data element

Language – The language in which the data element is specified

Definition- A statement that clearly represents the concept and essential nature of the data element.

Obligation – Indicates if the data element is required to always or sometimes be present (contain a value)

Datatype – Indicates the type of data that can be respresented in the value of data element

Maximum Occurrence – Indicates any limit to the frequency of the data element

Comment – A remark concerning the application of the data element

Fortunately, six of the above ten attributes are common to all the Dublin Core elements. These are, with their respective values.

Version : 1.1
Registration Authority : Dublin Core Metadata Initiative
Language : en
Obligation : Optional
Datatype : Character String
Maximum Occurrence : Unlimited

The above attributes will not be repeated in the definitions below, however, they do represent part of the formal element definitions.

The definitions provided here include both the conceptual and representational form of the Dublin Core elements. The Definition attribute captures the semantic concept and the datatype and Comment attributes capture the data representation.

Each Dublin Core definition refers to the resource being described. A resource is defined in [RFC 2396] as "anything that has identity". For the purposes of Dublin Core metadata, a resource will typically be an information or service resource, but may be applied more broadly.

Element	:	Title
Name	:	Title
Indentifier	:	Title
Definition	:	A name given to the resource
Comment	:	Typically, a Title will be a name by which resource is formally known
Element	:	Creator
Name	:	Creator
Identifier	:	Creator
Definition	:	An entity preimarily responsible for making the content of the resource
Comment	:	Examples of a Creator include a person, an organisation or a service Typically, the name of a Creator should be used to indicate the entity
Element	:	Subject
Name	:	Subject and Keywords

Identifier	:	Subject
Definition	:	The topic of the content of the resource
Comment	:	Typically, a subject will be expressed as keywords key phrases, or classification codes that describe a topic of the resource Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.
Element	:	Description
Name	:	Description
Identifier	:	Description
Definition	:	An account of the content of the resource
Comment	:	Description may include but is not limited to—an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content.
Element	:	Publisher
Name	:	Publisher
Identifier	:	Publisher
Definition	:	An entity responsible for making the resource available
Comment	:	Examples of a Publisher include person, an organisation or a service. Typically, the name of a Publisher should be used to indicate the entity.
Element	:	Contributor
Name	:	Contributor
Identifier	:	Contributor
Definition	:	An entity responsible for making contribution to the content of the resource
Comment	:	Examples of a Contributor include a person, an organisation, or a Service Typically, the name of a Contributor should be used to indicate entity.
Element	:	Date
Name	:	Date
Identifier	:	Date
Definition	:	A date associated with an event in the life cycle of the resource

Comment : Typically, Date will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 (W3CDTF) and follows the YYYY-MM-DD format.

Element : Type
Name : Resource Type
Definition : The nature of genre of the content of the resource.
Comment : Type includes terms describing general categories, functions,
Genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (for example, the working draft list of Dublin Core Types.[DCT 1].
To describe the physical or digital manifestation of the resource, use the FORMAT element.

Element : Format
Name : Format
Identifier : Format
Definition : The physical or digital manifestation of the resource.
Comment : Typically, Format may include the media-type or dimensions of the Resource. Format may be used to determine the software, hardware or other equipment needed to display or operate the resource. Examples of dimensions include size and duration. Recommended best practice is to select a value from a controlled vocabulary (for example, the list of Internet Media Types (MIME) defining computer media formats).

Element : Identifier
Name : Resource Identifier
Identifier : Identifier
Definition : An unambiguous reference to the resource

within a given context of a string or number of conforming to a formal identification system.
Example formal identification systems include the Uniform Resource Identifier (URI) including the Uniform Resource Locator (URL), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN)

Element	:	Source
Name	:	Source
Definition	:	A Reference to a resource from which the present resource is derived.
Comment	:	The present resource may be derived from the Source in whole or in part. Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.
Element	:	Language
Identifier	:	Language
Definition	:	A language of the intellectual content of the resource
Comment	:	Recommended best practice for the values of the Language element is defined by RFC 1766 [RFC 1766] which includes a two-letter Language Code (taken from the ISO 639 standard (ISO 639), followed optionally, by a two letter Country Code (taken from the ISO 3166 standard [ISO3166]. For example, 'en' for English, 'fr' for French, or 'en-uk' for English used in the United Kingdom.
Element	:	Relation
Name	:	Relation
Definition	:	A reference to a related resource
Comment	:	Recommended best practice is to refere the resource by means of string or number conforming to a formal identification system.
Element	:	Coverage
Name	:	Coverage
Identifier	:	Coverage

Definition	:	The extent or scope of the content of the resource
Comment	:	Coverage will typically include spatial location (a place name or geographic coordinates). temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity). Recommended best practice is to select a value from a conrolled vocabulary (for example, the Thesaurus of Geographic Names (TGN) and that, where appropriate, named places or time periods be used in preference to numeric identifiers such as sets of coordinates or date ranges.
Element	:	Rights
Name	:	Rights Management
Identifier	:	Rights
Definition	:	Information about rights held in and over the resource
Comment	:	Typically, a Rights element will contain a rights management statement for the resource, or reference a service providing such information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights. If the Rights element is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

The above discussion on different aspects of metadata in library terms, indicates that the Dublin Core is a simple system for cataloging Web Resources. However, Dublin Core is having certain limitations as realised by Dillion[5]. They are:

(*i*) **Degree of completeness**: The first published version of a qualified Dublin Core made available in July of 2001 is incomplete, with no qualifiers being offered to creator. contributor or publisher elements.

(*ii*) **Institutional Support:** Lack of institutional support due to the degree of incompleteness of the Dublin Core.

(*iii*)**Lack of proper documentation:** Documentation is necessary to follow a published standard. Documentation has not been provided in the beginning, but the recent release of a qualified Dublin core is accompanied with some usable documentation.

(*iv*)**Lack of implementation guidelines**: Directions are not available on how to implement the Dublin Core in HTML or XML.

(*v*) **Rules regarding extensibility:** Presribed direction on allowable extension to simple Dublin Core, or what syntax extensions must conform to are not framed.

The above list of limitations are of transitory nature and can be taken care of in the later revisions of DC standards.

Bishop and Garrison[6] in their report stressed the need for collaborative effort among libraries, archives and museums to support access to resources available on Internet through unified routes by as many users as possible. In this context, authors have felt that the advantage of adopting Dublin Core is that many specialised communities, archives, lbraries and museums are creating Dublin Core based derivatives for their communities. According to them, the use of Dublin Core helps in addressing various issues like–shared development, standards, inter-operability, resource discovery service, cataloguing issues and authority control.

6. CONCLUSIONS

Careful examination of changing trends in developing the Dublin Core standards, reveals interesting facts. It is evolved from the one originally conceived for use by authors of electronic documents to a more formal standard for use by specialists, including librarians in a retrospective mode – following the model of traditional cataloguing. The tug of war between the 'minimalists' who wants to preserve its simplicity and usability and the 'structuralists' who advocate the use of qualifiers to improve precision seems to be edging towards the structuralists camp. As Dublin Core standard develops and number of DC records grows, its developers are facing the problem of information storage and retrieval. The natural tendency is to refine the standard, but the result may move it so far away from the original concept that it is neither this nor that.

Let us for a moment consider that metadata standards continue to develop and move towards that level of precision that AACR2 currently achives. The same long pending issues and questions will be raised, like when to create a new record, how to deal with multiple versions of a work, how to describe resources that change over time and so on. The problems inherent in cataloging Internet resources—their instability, their lack of boundaries, are faced by metadata developers as well. Moreover, complete reliance on keyword searching will prove unworkable,as standardisation and consistency of access points are essential for effective searching. Ultimately metadata developers will have to confront the issue of authority control for names of persons, corporate names, geographic names, subject descriptors – all now combined with language and character set confusion on an immense scale. This problem is taken care of in preparing library catalogues using rules in Part II of AACR2.

At a more generalised level, there is a correspondence between AACR2 and metadata standards, and one can be converted into the other. But it is not an essay task. Considerable thinking and rough work on editing the content must take place to make matadata standards conform to AACR2 standards.

It is the responsibility of the library to provide effective access to the knowledge resources on the Web. Though this aspect is taken care of by various commercial services to certain extent, some of the key issues like authority control, evaluation, indexing and retrieval can be effectively handled and resolved with the intervention of library and information profesionals. A proper balance in the distribution of efforts between human intellect and technology can ensure both quality and efficiency in helping users gain the maximum benefits from the rich resources available in the internet environment.

I conclude my article with a positive statement about 'Metadata'. Metadata schemes need to be viewed as organic creations evolving in response to a changing environment, with the implication that a mechanism for effecting and controlling this evolution needs to exist. Such a mechanism, ideally is considered as legitimate and authoritative one, based on the input from the conerned user community.

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20

Impact of Information Technology (IT) on Library Management

ANIL KUMAR DHIMAN*

ABSTRACT

Change is the law of nature. The professional or the institution, which does not alter with the passage of time, always lags behind and goes into oblivion after some time. With the introduction of information technology, library environment is undergoing a rapid and dynamic change. At one hand, it has opened the new doors in the field of library and information science while on the other hand, has left many problems to be handled for their management in the LIS centres by library managers. This paper discusses the meaning of IT, its definitions and the problems to be faced in management of IT and its impact on library management with possible solutions.

1. INTRODUCTION

In the past, a phenomenal increase in information generation and usage with an ever-growing emphasis on science and technology on account of the role it is playing in socio-economic development has occurred. In 1800, there were only 100 scientific journals, which were increased up to 1000 in 1850, and up to 10,000 in 1900 while in 1950 they were estimated to be about 1,00,000 with an output of 50 lakhs articles. The annual addition to documents is expected to be in the order of 12-15 million (Ramana and Ranganath, 1989)[6]. Thus information explosion has created an urgent need for quick and economic communication systems. India is more than sufficient in information technology; it is being pushed forward by a well-organised and ambitious body of technicians and

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scientists who firmly intend to establish the country as a major force in the region and the libraries are passing through an exciting phase of transformation under the impact of information technology.

2. INFORMATION TECHNOLOGY

Information technology is a combination of computer and telecommunications technologies, which has made possible to help the people at work, in education and at home. Thus, it is all about the application of varieties of electronics to the information handling activities that are central to the operation of any organisation. The term Information Technology (IT) is of recent origin and is a comprehensive term. The term encompasses the notation of information handling. IT has defined in different ways by the different scientists and organisations as follows:

As mentioned by Sooryanaryana and Mudhol (2000)[9], the UNESCO has defined IT as "scientific technology and engineering disciplines and the management techniques used in information handling and processing and their application, computers and their interaction with men and machines associated with social, economic and cultural matters". According to Zorkoczy (1990)[10], in its restricted sense, IT is a new science of collecting, storing, processing and transmitting information. While Rayudu (1993)[7], has defined IT as "the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics based combination of computing and telecommunication".

So in brief, it can be stated that IT is a generic term used to denote all activities connected with computer based processing, storage and transfer of information. IT includes mainly computers besides electronic media, satellite, telecommunication and information. IT is a tool through which information is transferred, recorded, and edited, stored, manipulated and disseminated. Rather, we can call IT, as a science of information handling particularly using computers to support the communication of knowledge in technical, economic and social fields.

3. LATEST DEVELOPMENTS IN IT

Since civilisation, IT has gone under several changes, particularly in electronic era. Starting from the formation of clay tablets in

Babylonian civilisation, IT has travelled for its evolution through paper age, punched cards up to electronic media.

The important features that have affected the quality of information are accuracy, comprehensiveness, freshness and time. IT can be used in Library and Information science:

(*i*) to support technical functions associated with technical processing and circulation work.

(*ii*) to support information storage, retrieval and dissemination systems.

(*iii*)to support management of information services in libraries and

(*iv*) and for library extension services.

Although in electronic era, the IT has different fields that affected the life of human being as well as the information era, the most important technologies which are being utilised for library and information activities are as follows:

Networking, CD-ROM, Internet and Multimedia

3.1. Networking

The networking can be defined as the combination of more than one computer, which are interlinked together for data communication. Depending upon the distance covered in networking, the networks may be of two types *viz.*, Local Area Network or LAN and Wide Area Network or WAN (Dhiman, 2000a)[4]. The LAN is a digital communication facility, carrying data at high speed among a large number of information processors directly interconnected within a building or in adjacent buildings. The raw data transmission rate of LANs is very high as compared to the ordinary telecommunication circuits. In WAN, the computers are situated at a very long distance and are interconnected either with the help of satellite links or lease lines.

Computer networks play an increasingly important role in the libraries. Information services like references services, current awareness service, selective dissemination of information, computer assisted learning and user education are feasible with the help of computers beside the housekeeping operation like circulation and serial control etc.

3.2. CD-ROM

The CD-ROM or compact disc-read only memory is a silver plated disc of 1.2 mm thickness and 12 cm diameter. As, we cannot write any thing on it after writing once; hence it is called as read only memory. A CD can store 650 megabytes of data that is equal to data of around 550 floppies or 3,00,000 typed pages. Since, it stores large amount of structured data, bibliographic information, full text information and image types, it has brought about a revolution in the information world. Today, a large number of organisations around the world are publishing scientific data, bibliographic and full text information on CD-ROMs rather than other media.

The adaptability of CDs should be viewed not only as a new storage medium but also as a new information management technology as well as a viable and cost effective alternative to books and paper form, micro-images, magnetic disks, videos and audios for important storage and distribution. Since information is not just bibliographic records, abstracts and full texts but also graphics, sound and animation etc. so databases, which do not need to be updated quite frequently, and retrospective databases are most suitable for CD-ROMs.

It is noteworthy to mention here that now-a-days, writable and re-writable CDs are also available, on which we can write once or more than one time.

3.3. INTERNET

Simply, the Internet can be defined as the global network of networks. It is a network of interconnected WorldWide Webs of different types of organisations like universities, business, defence and science organisations etc. It has emerged not only as an important search device for the research and development community but also for political activists, farmers, librarians, journalists, scientists and many others. The various basic facilities which can be availed through INTERNET may be summarised as follows (Sinha and Dhiman, 2001)[8]:

3.3.1. Electronic Mail or E-mail

It is the most used service of the Internet. The messages can be sent to a single person or to a group of persons separately at the same time through this facility. Its speed is high and charges are low in comparison to postal service; owing to which, it enables

one to be in touch with the rest of the world in most economical and efficient way. E-mail programs allow us to save, print or reply the messages and also to attach word processing documents, graphics or video images with our reply.

3.3.2. List Servers

This is a discussion group created to share ideas and knowledge on a particular subject. The discussion groups are created and monitored by some one with an interest in that subject and are open to anyone. One can join the list simply by sending an E-mail request to the list. The programme automatically reads E-mail message and extracts your address and adds this to the circulation list. The message sent to a list is copied and then forwarded to every subscriber of the list. The first message tells you that you have successfully subscribed to the list.

3.3.3. Usenet/News Groups

Unlike the list servers, the news group servers provide access to thousands of topic – based discussion group services that are open to everyone. The newsreader software allows you to post an article to any group for others to read. A comment to a message can be added to the thread of the article and one can find answer to a specific question.

3.3.4. File Transfer Protocol or FTP

This is a mechanism that allows placing and retrieving of files over the Internet. It allows downloading of software, product up-gradation and other things. FTP servers also supply a small amount of text information. With the 'help' command one can get online help to know more about any doubts.

3.3.5. Telenet

This is used to denote the networking over the telephone. It is a simple programme created by the National Center for Super Computing Applications (NCSA) that uses transmission control protocol/internet protocol or TCP/IP to provide connection onto another computer. Using telenet you can contact a host machine by typing host name of IP member and can transfer files, from the TCP/IP host to your own computer and can access databases.

3.3.6. Gopher

The Gopher was created by the Microcomputer workstation center of University of Minnesota to find information on the Internet in a user-friendly way. It is a menu driven programme that allows you to click with information servers or 'Gopher holes' on the Internet to retrieve the information including text, sound and images.

3.3.7. World Wide Web or WWW

The web is a large system of servers and combines many of the Internet applications, which offers all kinds of information to any one on net. This is a series of interconnected documents stored on computer sites. If you use your computer and a software program called Browser to visit a site on the web, the screen displays a document called a home page. Home page gives the name of the organisation or individual sponsoring the web site and displays a slot of highlighted words, buttons or pictures. It is the text and graphical screen display that welcomes the user and explains the organisation that has established the page. Information using client/server architecture, graphical users interfaces (GUI) and a hypertext language enable dynamic links to other documents.

The Internet can be used to access the information from the remote to read, download and print the electronic books and journals and in reference service beside some of the housekeeping operations like acquisition and cataloguing etc.

3.4. Multimedia

This is a unique development in the field of information technology. Multimedia are the technologies that facilitate the integration of two or more types of media such as text, graphics, sound, voice, full motion video, or animation into a computer based application. It is a collection of multi-sensory presentation technologies combined through a common user interface into an information delivery system. The presentation data types can include text, images, graphics, audio, animation and video. The user interface is a computer – based system that might consists of CD-ROM disks and customized graphical display hardware for data compression, decompression, acceleration and transformation.

It allows the user to browse and navigate quickly any type of complex information. It is immensely helpful in the education

process and learning and can be used either as a single stand-alone system or multi-user system for information dissemination.

4. IMPACT OF INFORMATION TECHNOLGY ON LIBRARY MANAGEMENT

The introduction and application of IT techniques have elevated the modern day library to a very high pedestal and improving and altering its image, functions and service to revolutionary extent with great efficiency and effectiveness. At one hand it has opened the new doors for smooth functioning of the library, whereas, on the other hand, it has created some problems to be faced by the working professionals. Various software packages are available for budgeting, forecasting and planning of the library. The difficulty is for the management in taking decisions to select suitable products for automation.

IT has virtually immense potential for a variety of applications in libraries. IT helps libraries in creating databases of their collections and making them available for easy access to users inside as well as outside through networks. It enables libraries to provide most efficient and specialised information services. It is an established fact that efficient information support and effective communication in an organisation are closely associated with high performance, productivity and innovation. Most of the operations within a library are inter-related, inter-dependent and mutually supportive for the overall mission of the library. The use of IT applications to interface and integrate each function with the other saves a lot of time of the staff as the same data used may not be re-entered at every stage. The IT can be employed in four ways in the library.

(*i*) to automate the library

(*ii*) to automate the information storage and retrieval

(*iii*) to automate the library office and

(*iv*) for resource sharing networking

The automation helps libraries to improve their working. IT has speeded up the accessioning procedure, processing work by operation and accelerating elimination of a large amount of repetitive work. MARC is easy to manipulate as it can be searched online from which various types of outputs are available. Online bibliographic databases have significant effect on collection

development. By using the IT devices like computer (Dhiman, 1997)[2], fax, E-mail etc. the Library and Information Centres can easily search the online public catalogues (OPACs) of other libraries for a particular document and can share the resources for different purposes in a network (Dhiman, 1998)[3]. In Inter-Library Loan Services (ILLs), we can send the request for ILL to the other libraries and get the documents in short span of time. This all can be done through the LAN or WAN. Like many other services of the library and information centres, the IT has also influenced reference services. The new ITs have reduced the response time for reference query. Besides, the major reference sources are readily available in optical discs as well as from online databases.

5. CHALLENGES BEFORE LIBRARIANS AND LIBRARY MANAGERS

Technological advances in recent years have not only eliminated time and other barriers but also changed the operational tactics. But, simultaneouly as the rule, various types of the challenges started with the introduction of new technologies in front of the library policy maker and managers. The major threat or the competitors of the library professionals are the professionals from management and computer fields as the computer professionals are intruding into this profession. The others can be summarised as below:

5.1. Switchover to new technology

The introduction of new technologies have created the problem as to how traditional forms could be integrated with the electronic resources as most of the libraries have been developed along traditional lines where print media are predominant.

5.2. Lack of skilled manpower

Generally, it is seen that the library workers do not take much interest in grasping new technologies. This is more common with the case of those who are above 40 years of age. This is further enhanced if there are less or no chances of promotion in their life career. It definitely hampers the utilisation of modern technology to a great extent.

5.3. Financial constraints

The introduction of modern technology in different library services

and their associated system are out of the reach of the users due to high charges. Further, to develop infrastructure facilities and to access the electronic sources through communication networks, are expensive. But, the librarians and library managers are bound to make progress and keep pace with the changing environment within the limited resources. This is one of the major problems, which prevent the librarians or library mangers from thinking about new emerging demands of users, particularly in the Third World countries.

5.4. Ownership of the electronic publications

The difficulty in location of resources and lack of ownership of accessing resources is another challenge faced by librarians and library managers. As the published literature is available in more than one electronic form; the selection of appropriate form of electronic publications from the available vast sources is cumbersome. One of the important problems is associated with the issue return and stock verification policies of the electronic publications. With most of the books, particularly in the field of computer and management sciences, the CDs are coming free. Whether these can be treated as a part of the book or free resources, is a question for serious consideration. The author of this paper has already given a loud appeal on this issue in his article published in *DESIDOC Bulletin of Information Technology* (Dhiman, 2000b)[5].

5.5. Assessment of electronic publications

As mentioned earlier, the electronic publications are available in various forms and formats. The concept of evaluation in order to assess the relevance of information available in electronic format is another problem confronting of library managers.

5.6. Training of professionals and end users

Extra staff and funds are needed to train the present staff of the library and the library users to get acquainted with the modern technologies.

5.7. Recruitment of staff

The recruitment of well-trained candidates of high calibre suited to do work in the electronic environment setting aside all types of social, political, organisational pressures is very essential in the

present context.

5.8. Eye strain problem

While working with the computer, a person cannot sit more than three hours a day. Because sitting constantly more than three hours continuously develops eye strain and affects the eyes of the computer workers. This further creates the problem of recruiting extra staff to relieve those persons sitting o: the computer in the library.

5.9. Librarian's negative attitudes

Above all, the Librarian's negative attitude is another major problem. They react negative to any system, which alters the existing order of the library. Librarian's attitude towards use of new technologies requires re-examination and reformation for the successful application of technologies.

6. SUGGESTIONS TO OVERCOME THE PROBLEMS

The technological developments and those, which are in the pipeline, are going to change the complexion of all categories of the libraries. In future, the libraries will be called as electronic library and instead of books, there will be the optical disks to be borrowed and used at home or anywhere through a small portable electronic reader. There will be no need of classifying the documents and cataloguing them because the end user will be able to retrieve the data directly from the databases. Although many of the libraries today, feel that the IT should be integrated into their regular services, but there are many hurdles as discussed above, which hinder the librarians or library managers to start automation. The following are the suggestive solutions to the problems discussed earlier for the benefit of librarians and library managers:

(*i*) The librarians must become perfect information professionals in place of reference librarians, cataloguers or collection development librarians. This may call for a change in library education also.

(*ii*) The librarians in this new role should not only act, but act decisively, objectively and without prejudices in favour of traditional methods and practices.

(*iii*) The future planning must be done on the basis of sound analysis of problems and issues backed by thorough research.

(*iv*) Some extra funds should be provided to each and every library to develop infrastructure and to automate their different activities and services.

(*v*) And above all, there is an urgent need of giving higher salary and status to those staff members, who are computer literate and working in automation area in any library. Because, they are the persons who are not only literate in the field of library science but also having the specialisation in computer fields. So to avoid the dominance and intruding of computer persons in the library field and to motivate those who are already in library profession to take interest in the automation activities, they should be provided higher status and higher salary in comparison to the ordinary library trained staff.

7. CONCLUSION

Although, many of the libraries have already started automating their different activities and services but the poor situation in our country is that only 3% of the libraries are using computers and only 0.6% of the libraries using CD-ROMS technology for their use (Ashok Babu, 1999). Many of the libraries today feel that IT should be integrated into the regular services by the libraries. This is true because we are at the threshold of electronic age in which electronic media can play a crucial role in the provision of library and information services. If the management of these technologies could be done well and the hurdles discussed earlier, could be overcome then we can think about the automation of all library activities in its real sense.

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21

Management Information System in Libraries and Information Centres

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ABSTRACT

A management information system (MIS) is a set of formalised rules and procedures designed, maintained and used by people with the help of information processing technology, for the purpose of providing information to fulfil management needs. It provides for decisionmaking by synthesising and organising data.

A management information system captures data and information from many sources, internal and external to the organisation. This is used to guide and support rapid and effective decision-making. Decision support systems are higher developments of management information systems. They provide specific answers to management problems through Computer simulation and gaming techniques.

1. MANAGEMENT INFORMATION SYSTEMS

A management information system is a single source from which the manager can obtain specific information. It may be described as a collection, storage and presentation system. It provides a single, responsive, automated mechanism for delivering information from multiple sources to the manager in a usable form.

While management information systems operate within the technical subsystem of libraries and information centres, they are relevant to the management functions of communication, decision-making, planning, controlling and measuring the performance of human resources and the operational functions within libraries

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and information centres.

Typical management information systems establish or enhance control points within technical processes. They provide for control of information, which was previously not available for information sharing across departments. Often they reduce the time taken to perform certain tasks, allow other tasks to be executed which previously would have been too time-consuming, and generally improve the standard of reporting mechanisms.

2. ATTRIBUTES OF A MANAGEMENT INFORMATION SYSTEM

To be effective, a management information system should display the attributes listed below

2.1 Accessibility

The management information system should be made available to managers at all levels within the library or information centre. Information stored in the system should be able to be retrieved easily and speedily.

2.2 Comprehensiveness

The system should be as comprehensive as possibly. However, in reality this will depend upon top management's perception of the usefulness of the information which can be included in such a system.

2.3 Accuracy

A management information system should contain accurate data. Generally, two types of errors occur—errors of transcript and errors of computation.

2.4 Appropriateness

In designing the management information system, the information needs of all managers must be considered in order to ensure that the data and information contained in the system is appropriate. A delicate balance between paucity of information and information overload is needed. Irrelevant information is both costly to research, enter and store, and time consuming for the system users who will have to sift through the information at hand in order to identify the appropriate data or information.

2.5 Timeliness

Information and data must continually be updated to reflect the latest trends or situation audit, Out-of-date information is inaccurate information and has no place in a management information system.

2.6 Clarity

Information should be free from ambiguity. The purpose for, and sources of, the information or data which is stored on the system should be immediately available to the user.

2.7 Flexibility

Reference has already been made to the fact that the information stored on the system will be used by more than one level of management. The information must therefore be adaptable for use by more than one user.

2.8 Verifiability

The information contained in a management information system should be able to be verified. Sources of external data should be cited.

2.9 Freedom from Bias

As the information system or data contained in the management information system is to be used to facilitate decision-making, it is important that it is free from bias. The information should not be entered or modified after entry in such a way as to influence the users towards a particular course of action.

2.10 Quantifiability

A management information system should only contain data or information which has been obtained through formal communication channels and can therefore be suitably verified. It should not contain information which has been obtained through informal communication channels such as adhoc telephone conversations or rumours.

3. USE OF MANAGEMENT INFORMATION SYSTEMS IN LIBRARIES

Information use of a management information system is to provide information which assists in the evaluation of the performance of

the library or information centre. Evaluation process rely upon management having accurate and timely information about programme inputs and outputs.

A management information system can be used to provide supporting information to determine:

i. Efficiency: is the library doing things right ?

ii. Effectiveness: is the library doing the right things ?

iii. Competitiveness: is the library heading in a direction which is consistent with the environment (that is, does the library have strategy, and is it certain that it is the correct one ?)

Data, identified in the form of a performance indicator can be collected from various sources, stored in the management information system and used to verify performance of the library or information centre.

It could be stated that the effective and efficient provision of library services for the user is very much related to the internal performance of the organisation's resources. To illustrate the use of a management information system in monitoring the performance of resources, the following examples are chosen from the human resource module of the management information system.

A library's output performance is directly related the motivation and performance of its human resources. A high staff turnover rate which is monitored by the management information system and identified as occuring in a particular department or in a particular category of staff can indicate poor performance on the part of the employer. A high turnover rate of clerical staff may indicate that the management practices do not assist in proving for career progression or personal development and / or training opportunities.

Management information systems facilitate the collection of data from one source which can then be used for other purposes. Performance appraisals are not just annual opportunities to praise or reward good performance, to correct faults or to identify areas for personal development and training. The annual performance appraisal provides the opportunity to identify the organisation's underlying subcultures and to determine individual's values and benefits. If this information is entered into the management information system and subsequently analysed, subculture which

undermine the chosen corporate culture can be identified and measures can be taken to correct the situation.

4. DECISION SUPPORT SYSTEMS

Decision support system focuses attention on key decisions and decision-making tasks, with the specific aim of improving the effectiveness of the library manager's problem solving processes. All management decision-making should be logged in a decision support system which defines each problem as it was perceived, the information known at the time, the commonly held assumptions, some debatable issues, and the final decision.

Information in the decision support system should be retrievable in as many ways as possible to facilitate faster and better decision-making in the future.

5. CONCLUSION

By providing the means to collect, store and manupulate information, management information system can be used to identify issues and provide necessary input to facilitate effective decision-making. The management information system is used to determine the efficiency, effectiveness and competitiveness of a typical library. Moreover this type of information is more likely to be used in decision-making by top management.

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22

Role of I L A in Developing Best Library Practices for Quality, Services and Survival of Professionals : A Statistical Analysis

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ABSTRACT

The paper traces short history of Indian Library Association(ILA) Introduces organisational structure in short. Analyses terms of office of President and Secretaries. Analyses periodicity, gaps, months and duration of these conferences. Also analyses statewise distribution and places of the Conferences. Analyses hosts, inaugurations and welcome addresses. Analyses number of delegates and subject of the conferences. Suggests for inclusion of term "Information" in its name, formation of regional chapter and e-groups, preparation of e-mail directories, biographical directories and reservations for younger members and women members, etc.

1. INTRODUCTION

The word "Association" is derived from the English word "Associate" which means to unite or bring together those persons who share actively in anything as a buisness, enterprise or undertaking. It unite persons with a common feelings, pursuits and thoughts .

Library and Information Science is a profession. The profession is that which requires a high level of training and proficiency. Among the attributes which make an occupation a true profession are existence of a corpus of literature concerning the particular discipline; by definite educational requirements for those practising the profession; dedication of its members on an all time basis and vigorous active association serving the profession. The members of the profession comprise only those who follow the requirement of the profession .

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By forming a professional association we forge new concepts and programs by joint efforts. Difficulties of the individuals are shared and the benefits are multiplied. Jealousy, bias, lack of motivation should not emerge in an association. The association should not revolve round the chosen few only. Co-operation and professional respect are essential among the members .

Indian Library Association is a professional association of working , qualified and professional staff serving in various types of libraries and teachers of LIS and also the persons interested in promotion of libraries. I L A through the annual conferences develops best library practices for quality services and survival of the profession and professionals . These ILA conferences have been statistically analysed in this paper.

2. SHORT HISTORY

13th September 1933 is a remarkable day in the history of library profession in India when Indian Library Association was founded with founder members like S. R. Ranganathan , S. Bashiruddin , A. C. Woolner, Sant Ram Bhatia ,etc. with the aims to further the library movement in India, to promote the training of librarians and to improve the status and service conditions of librarians .

Historically, the Andhra Desa Library Association established in (1914) is the first library association in India and Lahore Conference of librarians held in (1918) was the first librarians meet in India . India's next Public Library Conference was held in (1919) at Madras. Library associations in Maharashtra (1921), Bengal (1926) Madras (1928) and Punjab (1929) were formed as a consequence. M O Thomas, Librarian, Annamalai University gave an idea for forming an All India Library Association in 1933 in an issue of Modern Librarian published from Lahore. Subsequently, All India Library Conference was held on Sept. 1933 at Calcutta ,which resolved on 13th Sept. to form the Indian Library Association. Dr. A. C. Woolner, the then V C of Punjab University was its first Chairperson , M .O. Thomas & Mr. K .M. Asadullah were provisionally its first Vice-Chairperson and Secretary respectively[2&3].

3. ORGANISATIONAL STRUCTURE

Indian Library Association has following types of members :-

1. Life
2. Ordinary
5. Institutional
6. Library Association

3. Patron
4. Honorary
7. Associate

It has a Council as the highest policy making body comprising elected members, opted members, nominated chairpersons of Central Sectional Committees, representatives of Association and Office bearers of the association. It constitutes an Executive Committee. The work is distributed among 23 Special Interest Groups or Central Sectional Committees. A list of Presidents & Secretaries is given in Table 1.

Table-1: List of ILA Presidents & General Secretaries

SN	Year	Presidents	Gen. Sec.	S.N.	Year	Presidents	Gen. Sec.
01.	1933-37	M O Thomas	K M Asadullah	13	1975-78	D R Kalia	O P Trikha
02	1937-40	Wali Mohd.	K M Asadullah	14.	1978-81	B L Bhardwaj	O P Trikha
03	1940-44	John Sargent	K M Asadullah	15	1981-83	P B Mangla	O P Trikha
04	1944-46	S.R. Ranganathan	K M Asadullah	16.	1983-85	Girja Kumar	J L Sardana
05	1946-49	S.R. Ranganathan	B N Banerjee	17.	1985-88	T S Rajagopalan	C P Vashishath
06	1949-53	S.R. Ranganathan	S Das Gupta	18.	1988-90	Krishan Kumar	C P Vashishath
07	1953-60	B S Keshvan	G B Ghosh	19	1990-92	S C Biswas	M L Kachroo
08	1960-64	Nihar Ranjan Ray	B Majumdar	20	1992-94	C P Vashishath	A P Gakhar
09	1964-66	P N Gaur	D.R. Kalia	21	1994-96	P S G Kumar	A P Gakhar
10	1966-68	Sohan Singh	D.R. Kalia	22	1996-98	P N Kaula	R P Kumar
11	1968-72	B V R Rao	J C Mehta	23	1998-00	J L Sardana	O P Gupta*
12	1972-75	S. Bashiruddin	O P Trikha	24.	2000-02	Kalpana Das Gupta	P R Goswami
				25.	2002-04	To be elected	To be elected

* On resignation of Pandey S. K. Sharma from Sept. 1999.

3.1. Presidents

The table 1 shows M. O. Thomas as its first President from 1933-37 for 4 years though the first (provisional) Chairperson was A. C. Woolner. Dr. Ranganathan was its president for the longest period from 1944 to 1953. It was during this period that the first Public Library Act was passed in 1948 in Madras. B. S. Keshwan was president for 1953-60 for the second longest period. Then after M. O. Thomas 1933-37. John Sargent 1940-44. Nihar Ranjan Ray 1960-64 & B.V. R. Rao 1968-72 follows. No President was elected twice with a "break of term though many were elected in consecutive terms. Since 1972-75 the term of S. Bashiruddin. as 12 th President, to the present 24th President , none have been elected for a second term. It shows continuing interest of library professionals and should be considered

as a healthy sign of competition among I L A members, though, a longer term may be healthy for the association.

3.2. General Secretaries

K M Assadullah was it's first General Secretary having longest term as General Secretary from 1933 to 1946. He also had the honour of working with four I L A Presidents. O P Trikha was General Secretary from 1972 to 83, second longest term , also having honor of working with four I L A Presidents.. D.R. Kalia (1964-68) , C P Vashistha (1985-90) & A P Gakhar (1992-96) have worked with two I L A Presidents each.

D. R. Kalia , J L Sardana & C P Vashistha were General Secretaries earlier & later were elected as Presidents, though not in very next election, but after some gap ranging from 2 to 13 years.

4. OBJECTIVES

I L A constitution has been revised several times to accommodate newer objectives to assure best library practices from time to time . A few chief objectives are :-

(*i*) Promotion of Library movement and improvement in Library & Information services.

(*ii*) Promote L I S education & training .

(*iii*) Propmulgation of appropriate library legislation .

(*iv*) Improvement in status & condition of service .

(*v*) Establishment of Libraries .

(*vi*) Holding Conferences & meetings for discussion of professional, technical & organisational issues , etc.

5. ILA CONFERENCES

Holding of annual conferences and occasional seminars has been I L A's major objective and activities since the beginning . A general body meeting is also held along with the annual conferences. A pre conference volume is brought out and circulated at a reasonable discount price at conference venue. Besides, it also organises occasional national seminars. It publishes *I L A Bulletin* and *I L A Newsletter* as official publcations and these are distributed free to its members.

Holding of the conferences proved to be right plank for the professionals to interact with their counterparts on the issues of professional concern. The conferences, in addition to generating

academic discussion, have also provided an effective forum to the professionals to work out strategies for countering challenges posed from time to time[2].

This paper analyses 46 conferences held so far, (before this conference at Warangal). Table 2 (Appendix) provides useful data about each conference. One single table has been prepared for complete data but it has been broken into two tables for convenience. Table 2a provides basic data and Table 2b provides data about hosts, inaugurators and welcome addresses.

Table-2a : ILA Conference at a glance

C.N.	Year	Month	Days	Gap	Place	State	Dele. gates	Main Areas/ Theme
01	1933	Sept 12	03	-	Kolkata	WB	27	Reading Material
02	1935	April 19	04	19	Lucknow	U.P	44	Classification, Org., Abs
03	1937	Dec. 22	03	32	Delhi	U.T.	35	Lib. Adm.
04	1940	Apr. 13	02	28	Patna	Bihar	74	Lib. Service
05	1942	Apr. 04	03	24	Bombay	Mah.	82	Ref. Service
06	1944	Apr 07	04	24	Jaipur	Raj.	100	Cataloguing
07	1948	Jan 25	03	45	Baroda	Guj.	53	N.A.
08	1949	Jan 19	03	12	Nagpur	Mah.	150	Lib. Services, Pub. Lib.
09	1951	May 11	05	28	Indore	M.P.	250	Bibliography & Docu.
10	1953	June 01	06	24	Hyd.	A.P.	200	Lib. Ser., Ref. Ser., Lib. Class.
11.	1956	Apr. 07	05	33	Kolkata	WB	100	Sp. Lib., Pub. Lib., Lib. Edu. Bib. & Doc., Class
12	1960	Apr. 17	02	48	Kolkata	WB	100	Lib. Cooperation, Pub. Lib., Trends, Status, Service
13	1962	Feb 10	03	22	Kolkata	WB	122	Bibliography &Documentaion
14	1964	April 10	06	26	Patna	Bihar	191	Lib. Ser., Legislation
15	1965	June 17	03	14	Mysore	K.N.	205	N.A.
16	1966	Nov. 26	03	17	Chandigarh	UT	189	Special., Childern Library
17	1968	Dec. 27	04	23	Indore	M.P.	300	Reding Material, Perssonnal
18	1969	Dec. 29	03	12	Tirupati	A P	375	Stock Verification
19	1972	Mar 24	03	27	Delhi	Delhi	400	Bib. & Doc., Book trade, Price
20	1973	July 09	04	15	Hyderabad	A.P.	350	Lib. Coop., Res. Sharing
21	1974	Jan 13	04	06	Bhuvaneshwar	Orrisa	300	N.A.

22	1975	Jan 17	04	12	Delhi	Delhi	600	Un. Lib., Res. Lib.
23	1976	Oct 06	06	21	Srinagar	J&K	760	ILA
24	1978	Jan 29	04	15	Banglore	Karna	570	Lib. Coop., Res. Sharing
25.	1979	May 14	05	15	Trivendr.	Kerala	550	Pub. Lib , Lib. Res. , Standards
26	1980	March 06	04	10	Delhi	Delhi	500	Lib.Ser., Book Trade Price
27	1981	Jan 09	04	10	Hyd.	A.P.	470	Legis. , Stock Verification , Price
28	1982	Oct 20	04	21	Lucknow	U.P.	650	Pub. Lib, Book Trade, Nat . Inf. Sys.
29	1983	Dec 05	05	14	Mysore	K.N.	500	Pub, Acd. Lib, Trade, Price, Sp. Lib. inf Sys, Comp
30	1985	Jan 28	04	13	Jaipur	Raj.	600	Reading Material
31	1985	Nov 01	04	10	Baroda	Guj	400	Compu ,Pub. Sp. & Child. Lib.
32	1987	Jan 03	04	14	A.pur	A P	250	Quality , Schoo; Children Lib.
33	1987	Dec 28	04	11	Trichurapalli	TN	350	Modernisation , Quality
34	1988	Dec 20	04	12	Kolkata	WB.	N.A.	Services
35	1989	Nov 07	04	11	Pune	Mah.	450	Standardisation
36	1990	Dec 26	04	13	Jodhpur	Raj	600	Network, Computerisation
37	1991	Dec 04	04	12	Madras	TN.	350	Information Polcy & Prog.s
38	1992	Nov 21	04	11	Bh.uaneshwa	Orrisa	318	Information Tecnology
39	1994	Jan 07	04	14	Bangalore	Kar	415	Movement, Lib. development
40	1995	Jan 05	04	12	Panaji	Goa	342	Information Technology
41	1996	Jan 07	04	12	Vijaywada	A P	230	Human Relation
42	1996	Dec 21	04	11	Kerala	315		National development
43	1997	Nov 05	04	11	Chandigarh	U.T.	350	Sustainable, I T, Inform. Ser.
44	1999	Feb 25	04	14	Hyderabad	A.P.	281	Electronic Era, Indian Libraria
45	1999	Dec 23	04	10	Hissar	Har..	179	Lib. Vision 2010, IT Appl.
46	2001	Jan 03	04	12	Ahemdabad	Guj.	NA	Quest for Quality
47	2001	Dec. 20	04	12	Warangal	A.P.	*	Best Library Practices

Table-2 b :ILA Conference at a glance

C.N.	Year	Place	Hosted by	Inauguratied by	Welcome by
01	1933	Kolkata	Imp.Lib.	Edu. Comm., India	Brahmchari
02	1935	Lucknow	L U	VC	VC
03	1937	Delhi	DU	Secretary, India	Professor
04	1940	Patna	PU	CJ(HC)	Edu. Comm., India
05	1942	Bombay	BU	VC	VC
06	1944	Jiapur	Jaipur State.	CM	Spl. Officer, Jaipur
07	1948	Vadodra	BLA+ SCL	Maharani	VC
08	1949	Nagpur	N U	Governor	President, I L A
09	1951	Indore	Indore State +SCL	Union Minister	Curator, Central Library
10	1953	Hyderabad	OU	CM	President, I L A
11.	1956	Kolkata	CU	Governor	Uni. Libraria
12	1960	Kolkata	I L A	N.A.	President, I L A
13	1962	Kolkata	I L A	Secretary, India	Nati. Librarian
14	1964	Patna	PU	Union Minister	Uni. Librarian
15	1965	Mysore	MU	VC	Union Minister.
16	1966	Chandigarh	PU	Chief Commisioner	President, I L A
17	1968	Indore	IU	Governor	Asst. Edu. Advisor, India
18	1969	Tirupati	SVU	VC	President, I L A
19	1972	Delhi	ILA+NBT	President, India	President, I L A
20	1973	Hyderabad	ALSD	Governor	President, I L A
21	1974	Bhuvner	ULA + Ag Uni.	Governor	President, I L A
22	1975	Delhi	DU	V P, India	President, I L A
23	1976	Srinagar	ILA-SC	Governor	President, I L A
24	1978	Banglore	Dept. of Pub Lib.	Governor	President, I L A
25.	1979	Trivendr.	ILA-SC	State Minister	President, I L A
26	1980	Delhi	NBT	Justice	President, I L A
27	1981	Hyderabad	ALSD	State Minister	President, I L A
28	1982	Lucknow	UPLA+ U P Govt.	State Minister	President, I L A
29	1983	Mysore	MU	State Minister	President, I L A
30	1985	Jaipur	RLA+RU	I/C Governor	President, I L A
31	1985	Baroda	Dept. Pub. Lib	State Minister	President, I L A

32	1987	Annathpur	KU	Justice	President, I L A
33	1987	Trichurapa.	BU	VC	President, I L A
34	1988	Kolkata	BLA	CM	President, I L A
35	1989	Pune	PU	VC	President, I L A
36	1990	Jodhpur	JU	Maharaja	President, I L A
37	1991	Madras	IIT	Governor	President, I L A
38	1992	Bhuv'war	UU	VC	President, I L A
39	1994	Banglore	Dept. Pub.Lib.	State Minister	President, I L A
40	1995	Panji	G.U.	VC	President, I L A
41	1996	Vijaywada	APLA	State Minister	President, I L A
42	1996	Calicut	CU	State Minister	VC
43	1997	Chandigar.	PU	MP	VC
44	1999	Hyderabad	PSTU+ALSD	State Minister	President, I L A
45	1999	Hissar	HAU	Chairmen, ASRV	President, I L A
46	2001	Ahemdabad	Nirma Inst.	Governor	President, I L A
47	2001	Warangle	K.U.	To be held	To be held

5.1. Periodicity

I L A holds annual conferences at different places. So far (before this one at Warangal) I L A has organised 46 conferences since first one in 1933, when I L A was formally formed. Before independence it held only 6 conferences in 14 years due to World War and Indian Independence Movement . After independence it held only 5 conferences upto 1959. In 1960's I LA conferences were held more regularly and 7 conferences were held. In 1970's again 7 conferences were held. In 1980's it became a regular feature and all the ten conferences were held . So is the case in 1990's .Thus I L A now holds the annual conferences very regularly .

5.2. Gaps in consecutive conferences

As stated above, holding of conferences is an annual regular feature of the I L A now. Till 1970's there were gaps of many years. Sometimes I L A held two conferences in the same calendar year due to administrative and geographical reasons. A usual gap of 10-14 months is considered a normal gap for an annual conference. 23 conferences (54.34%) were held within the gap of 10-14 months. The 23rd conference was held after a gap of six months only, though in two different calendar years. A gap of 15-19 months occur in 05 (10.87%)

conferences. A gap of 20-24 months occur in 7 (6.70 %). Earlier gaps were 25 to 48 months in (17.30 %) conferences as given in Table 3

Table-3 : Gaps in Months in Conferences

S.N.	Gaps (in months)	Conference Numbers	T	%
01.	Less than 10 month	21	01	02.17
02.	10-14	08 , 15 , 18 ,, 22 , 26 , 27 ,29 — 47*	25	54.34
03	15-19	02 , 16 , 20 , 24 , 25	05	10.87
04	20-24	05 , 06 , 10 , 13 , 17 , ,23, 28	07	15.21
05	25-29	04 , 09, 14 , 19	04	08.70
06	30-34	03, 11	02	04.30
07	35-40	-	-	-
08	40- above	07, 12	02	04.30

*** To be held**

5.3. Months of I L A Conferences

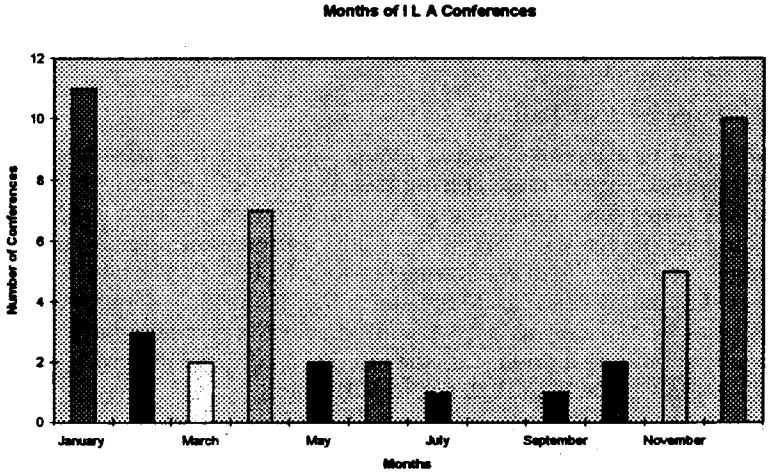
For organising I L A conferences geographical areas and local conditions have to be considered by the organisers to decide the month of the conference. For these reasons, the months may vary from conference to conference . Since 1981 I L A is holding most of the conferences in late December or early January, except few. This has made the conference a regular feature and is helpful to the participants to schedule their program in advance. The data has been analysed in Table 4 and graph 1.

Table- 4 Months of ILA Conferen.ces (N = 46)

S.N.	Month	Numbers of Conference	T	%
01	January	07, 08, 21,22, 27, 30,32, 39,40, 11	11	23.2
02.	February	13 , 24, 44	03	6.52
03.	March	19 , 26	02	04.3
04.	April	02 , 04 , 05 ,0 6 , 11 , 12 ,14	07	15.2
05.	May	09 , 25	02	4.3
06.	June	10 , 15	02	4.3
07.	July	20	01	2.2
08.	August	Nil	00	00

09.	September	01	01	2.2
10.	October	23 28	02	4.3
11.	November	16, 31 ,05 ,38, , 43	05	10.9
12.	December	03, 17 , 18 ,29 , 33 , 34 , 36 , 37 , 42, 45, 46*	10+1	21.7

* To be held



Graph 1

The Table 3 shows that highest number of conferences are held in December and January. In all 21 (45.6%)(plus this one) conferences were held in these months. 10.9 % conferences were held in November and 6.52 % in February. Thus from November to February 63% I L A conferences were held and 15.2 % were held in April , but all upto 1964. In earlier years , a few conferences were held in different months of the year as shown in the above table and graph.

5.4. Duration of conferences

I L A now holds conferences of 4 days duration since 30th conference in 1985 . Four conferences (8.70%) were of 5 days and 3 conferences (65.2 %) were of 6 days duration . Upto 19th conference (1972) shorter duration conferences were prevalent as shown in the Table 5

Table-5: Number of Days : Duration of conferences

S.N	Days	Conference No.	T	%
01.	01	-	00	00.0
02.	02	04,12	02	04.35
03	03	01,03,05,08,13,15,16,18,19	09	19.60
04.	4	02,06,07,17,20—22,24,26,-28,30-47*	28 +1	60.90
05	5	09,11,25,29	04	08.70
06	6	10,14,23	03	06.52

*** To be held**

5.5. Statewise distribution

India is a vast country having places of historical , cultural and professional importance. During last 68 years of history of I L A, various states have organised I L A conferences. Andhra Pradesh has topped the list with 7 (15.2 %) (plus this one) followed by West Bengal 5 (10.86), Delhi and Karnataka 4 each (8.7 %). The table 6 the gives the rank order also .Many states like Himachal , Uttaranchal have not organised any I L A conference. Many states have not organised for long period ,e.g. the last I L A conference in M.P. was held in 1968, in Delhi in 1980 and in U.P. in 1987.

Table-6 : Statewise Distribution of ILA Conferences

C N	States	Conference No. & Place (N=46)	T	%	Rank
11	Delhi (Capital)	03,19,22,26	04	08.7	03
12	NE & EASTERN STATES				
122	Uttar Pradesh	02,28 Lucknow	02	04.3	05
124	Bihar	04,14 Patna	02	04.3	05
125	Vananchal		-	-	-
127	West Bengal	01,11,12,13,34 Kolkata	05	10.86	02
128	HIMALAYAN STATES				
1281	Sikkim	-	-	-	-
1282	Assam	-	-	-	-
1284	Arunachal Pradesh	-	-	-	-
1285	Nagaland	-	-	-	-
1286	Manipur	-	-	-	-
1287	Mizoram	-	-	-	-
1288	Tripura	-	-	-	-

12891	Meghalya	-	-	-	-
13	SE& SOUTHERN STATES				
132	Orrisa	21,38 Bhuvneshwar	02	04.3	05
133	Chattisgarh	-	-	-	
135	Andhra Pradesh	10,20,27,44 Hyderabad; 18 Tirupati; 32 Annatpur; 41 Vijawada ,47 Warangal	15.2	01	
137	TamilNadu	33,37 Chennai	02	04.3	05
138	Kerala	25 Trivandram ;34,42 Calicut	03	06.5	04
1392	Pondichery	-	-	-	-
1394	.Andaman & Nicobar (I)(UT)	-	-	-	-
1396	.Lakshadweep (I) (UT)	-	-	-	-
15	S W & WESTERN STATES				
152	Karnataka	15,29 Mysore ; 24,39 Bangalore	04	08.7	03
154	Goa	40 Panji	01	02.1	06
156	Maharashtra	05 Mumbai ;08 Nagpur ; 35 Pune	03	06.5	04
158	Gujrat	07,31 Vadodara ;46 Ahamedabad	03	06.5	04
1592	Dadra & Nagar Haveli (UT)	-	-	-	-
1594	Daman & Diu (UT)	-	-	-	-
16	CENTRAL STATES				
161	Madhya Pradesh	09,17 Indore	02	04.3	05
17	N W STATES				
171	Rajasthan	06, 30 Jaipur ; 36 Jodhpur	03	06.5	03
173	Haryana	45 Hissar	01	02.1	06
175	Punjab	-			
1792	Chandigarh (UT)	16,43 Chandigarh	02	04.3	05
18	NORTHERN STATES				
182	Jammu & Kashmir	23 Shrinagar	01	02.1	06
184	Himachal Pradesh	-	-	-	-
188	Uttaranchal	-	-	-	-

* States arranged according to Uniform tables * To be held

5.6. Places of Conferences

Table 7 shows places of I L A conferences in rank order. Hyderabad and Delhi with 4 each follows Kolkata with 5 conferences at the top.

Two conferences each were held at Pune, Indore, Lucknow, Mysore, Jaipur, Vadodra , Chennai, Bhuvaneshwar and Bangalore. The table also provides information regarding the year of last I L A conferences held at that place.

Table-7 : Place of ILA Conferences : Rank Order

S.N.	Place	Total	Last	Rank	S.N.	Place	Total	Last	Rank
01	Kolkata	05	1998	01	07	Mysore	02	1983	03
02.	Hyderabad	04	1999	02	08	Jaipur	02	1985	03
03	Delhi	04	1980	02	09	Vadodra	02	1985	03
04	Patna	02	1964	03	10	Chennai	02	1991	03
05	Indore	02	1968	03	11	Bhuvaneshwar	02	1982	03
06	Lucknow	02	1982	03	12	Bangalore	02	1994	03

5.7. Host

39 conferences have been organised by individual institutions while 7 conferences have been organised jointly by two institutions as shown in the Table 7 and Table 8. Universities top this list by organising 22 times and twice jointly. Besides 2 conferences have been individually hosted by Agricultural Universities and one by an I I T and one by private management institute . State Government, Department of Public Libraries and State Central Libraries held 5 individually and 4 jointly . Library Associations have organised 8 I L A conferences individually and 6 times jointly .National Book Trust organised once individually and once jointly.

Table-8 :Types of Hosts of I L A Conferences : Single / Joint

S.N.	Host Academic Libraries	Single	Joint	Total
01a.	Universities	22	02	24
01b.	Agricultral University	01	01	02
02.	Private College	01	-	01
03	I I T	01	-	01
04.	State Govt.	01	02	03
05.	Dept. Pub. Lib	03	-	03
06.	Imperial Library, State Central Libraries	01	02	03

	Library Associations			
07.	I L A / I L A S C	04	01	05
08	Acd. Lib. Sc. Doc.	02	01	03
09	State Library Associations	02	04	06
10.	National Book Trust	01	01	02
	Total	39	14	53

Table- 9 : Types of Host Organised : Conferencewise

S.N	Host Organised	Conference No.	T	%
01.	University Library	11,14, 18, 21, 22,29,30,32, 33,35,36,38,40, 42,45 ,47	26+1*	56.52
2	Private Institution	46	01	02.17
3	IIT	37	01	02.17
04.	State Govt.	06, 09, 28	03	06.52
05.	Dept. Pub. Lib.	24,31,39	03	06.52
06	Inperail & State Central Lib.	01, 07, 09	03	6.52
07	ILA & ILA S C	12,13,19,23,25	05	10.87
08	Acad. of Lib Sc Doc.	20,27,44	03	6.52
09	Lib. Association	07,21,28,30,34,41	06	13.04
10	NBT	19, 26	02	4.34

*** To be held**

5.8. Inauguration

I L A conferences have had the privilege of being inaugurated by many dignitaries of India. Hon . President and Hon. Vice-President of India have inaugurated it once each . Similarly Maharaja/ Maharani of the then States have also inaugurated once each. Governors of the states holding the conferences top the list followed by State Ministers and Vice Chancellors. It is seen that in most of the I L A conferences, politicians have been associated but so far not many states have enacted public libraries acts. No Prime Minister has inaugurated it so for. Chief Minister, Chief Justice, Judges, Union and State Ministers, etc. have also inaugurated I L A conferences as shown in Table 10.

Table-10 : Inaugurations : In order of significance

S.N.	Inauguration	Total	%	Rank
01	President/ Vice President, India	02	4.35	5
02	Maharaja/ Maharani	02	4.35	5
03	Governor of the State	10	21.73	1
04	Chief Ministers	03	6.54	4
05	Union Ministers	02	4.35	5
06	State Ministers	09	19.56	2
07	Member iof Parliament	01	02.76	6
08	Vice Chancellors ,Universities	08	17.39	3
09	Chief Jusitce/Justice	03	06.5	4
10	Others	05	10.86	-
11	No Information	01	02.17	-
	Grand Total	46	100	

5.9.1 Welcome

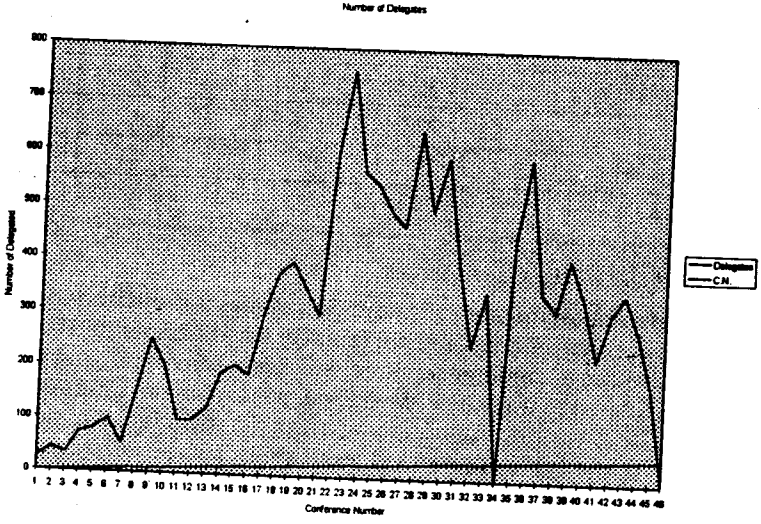
In most cases welcome addresses have been given by Presidents of the I L A . (66.4%) followed by Vice Chancellors of the universities and library professionals (10.8 %) each. Other distinguished persons have delivered the welcome address in some conferences. Table 11 shows that the practice of the welcome address being delivered by the President of ILA has been a more common practice.

Table-11 Welcome : Rank Order

S.N.	Welcome	Number	%	Rank
01	President ILA	31	66.40	1
02	Librarrian / Curator, University Librarian, Nati. Libr	05	10.86	2
03	Vice Chancellor	05	10.86	2
04	Edu. Commissioner/ Sp. Officer	03	06.50	3
05	Professor	01	02.17	4
06	Individual	01	02.17	4
	Total	46	100	

5.9.2. Number of Delegates

This is a very important aspect. The success of the conference largely depends upon the number of delegates. In the beginning ,till 1947, it ranged between 33-100 members only . From 8th to 16th the number increased to 100-200 delegates .From 17th (1968) to 21 there was a sudden steep rise and the figure ranged between 300-400 delegates. It reached above 400 and after this touched 760 in Srinagar and 600 in Jaipur and Jodhpur . Unfortunately the figure is going down since the 37th conference and came down to as low as 179 at Hissar. This has been shown in graph 2



Graph 2

There is correlation between place and number of delegates. Srinagar attracted highest figure followed by Lucknow, Delhi, Jaipur and Jodhpur, which are good tourist places. Hissar was so low because it is not a tourist place, and delegates from Delhi , Haryana and Punjab too did not bother to attend it .

The Table 12 shows conference numbers with range of delegates. 7 conferences had 300-350 delegates. 6 conferences had 51-100 delegates. 5 conference each had delegates between 401-500 .

Table -12 : Conferences with Range of Delegates

S.N.	No. of Delegates	Conference No.	T	%
01.	Less than 50	01—03	03	06.5
02.	51- 100	04,—07,11-12	06	13.0
03.	101-150	08,22	02	04.3
04.	151-200	10,14,16,45	04	08.7
05.	201-250	09,15,32,41	04	08.7
06.	251-300	17,21,44	03	06.5
07.	301-350	20,33,37,38,40,42,43	07	15.2
08.	351-400	18,19,31	03	06.5
09.	401-500	26,27,29,35,39	05	10.8
10.	501-600	72,24,25,30,36	05	10.8
11.	601-above	28. 23	02	04.3
12.	N. A.	34,46	02	04.3

5.9.3. Subject of the Conferences

This is very important area. of study . Sometimes it is difficult to find out the exact subject area of a conference, since number of themes are discussed in a conference. Subthemes are important and have been considered in this table. We have depended on the information available from various sources, and arranged them systematically as shown in the Table. Table 13 shows various subjects discussed in I L A conferences and the year of deliberations. Subjects like computers and networking have been discussed in 15 conferences. Various library services was a subject matter of 17 conferences . Various types of libraries were focus of discussion of 15 I L A conferences . Similarly other subjects too have been discussed in various I L A conferences as shown in the Table 13 .

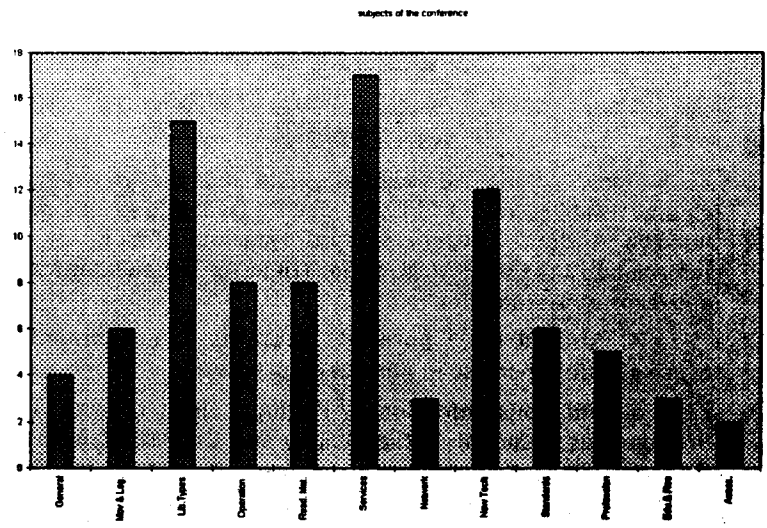
Table-13 : Subject of the Conferences

S.N.	Subject /Theme	Years
01	Libraries in General	
	Role in National Development.	1996
	Sustainable I. I S	1997
	Indian Librarianship	1999
	New Trends	1960

	Total	04
02	Library Movemnent & Legislation	
	Library Movement	1994,96
	Library Legislation	1964,81,90
	Total	05
03	Types of Libraries	
	Public Library	1949,56,60,79,82,83,85
	Children Library	1985, 66
	Academic Library	1983
	School Library	1956,66
	University Library	1975
	Research	
	Library	1975
	Special Library	1986
	Total	15
04	Library Operations	
	Administration	1937
	Classi fication	1935,44,53,56
	Cataloguing	1948
	Stock Verification	1969,81
	Total	08
05	Reading Material	
	Reading Material/ Collection Dev.	1933,65,68
	Book Trade/ Price	1972,80,82,83
	Total	07
06	Library Services and Resource	
	Sharing Library Services	1940,49,53,64,80,88,96
	Reference Service	1942,1959,1963
	Bibliography & Documentation	1951,56,62,72
	Cooperation & Resource Sharing	1960,73,78
	Total	17
07	Networking	
	Information Systems & Networ	1982

	Special Libraries & Information Systems	1983
	Networks	1990
	Total	03
08	New Technology	
	Computers & I T	1980,83,90
	Information Technology	1992,95,97,99
	In Electronic Era	1999
	Modernization	1987
	Preparing for 21st	1995
	I T & Lib Man.	1997, 2000
	Total	12
09	Standards & Norms	
	Standards , Norms	1979, 1989
	Quality	1987,2001
	Standardization	1989
	Policies & programs	1991
	Total	06
10	Profession	
	Pay, Status,Service Condition	1960,73,75
	Personnel	1968
	Human Relation	1996
	Total	05
11	Education & Research	
	Education	1956,85
	Research	1979
	Total	03
12	Organisation & Association	
	Association	1935,76
	Total	02

*** Source :**



6. CONCLUSION

I L A conferences have achieved a status among professionals . Many other conferences are held in the country related to this profession nowadays. I L A has to work harder to gain credible identity. I L A certainly provides an opportunity to many younger authors to interact with other professionals and motivates them to write. This objective should continue in future so that new generation is ready in due course of time to contribute professionally. However, more rigorous selection of papers can be expected in near future due to increasing .number of contributors.

Often the I L A conferences pass unnoticed at national level. It may take some time to attain the status of National Science Congress which is in news every year. Still it should not pass unnoticed and every efforts should be made to attract the media.

ILA has to do more efforts with regard to Public Library Movement and Legislation which was its ultimate aim at the time of its establishment. We can not sink in the ocean of internet and computers. Steps have to be taken to implement resolutions made in the ILA conferences. Otherwise these have no meaning. Lakhs and Lakhs of rupees are spent by organisers, sponsors and participants. It should not become a place of holidaying and recreation but of real hardwork for intellectuals and professionals . ILA will hold Golden Jubilee

conference in Dec. 2003/ Jan 2004 and steps must be taken right now to celebrate it more elegantly and meaningfully. States now a days are not willing to enact library acts due to extra tax burdens . Fee based public library services may be a solution to the problem .

6. SUGGESTIONS

1. I L A should include "Information" in its name though it may not change its abbreviation " I L A" like F I D has done. It's name may be Indian Library and Information Association or Information and Library Association (India) or Indian Information and Library Association ,etc.
2. I L A should have parallel sessions to accommodate overwhelming increase in number of papers .
3. I L A should constitute Zonal / Regional chapters with Vice President. as Presidents of the Chapter and Council Members as Secretary . Others may be nominated from among I L A members . These may organise seminars in regional languages.
4. Efforts should be made to increase membership as a campaign to mark the 50th conference number. Every life member may be requested to enroll at least one life member by that time . The promoter of ILA award need amendment. It reads , "50 life or ordinary members in an year" . These should be 15 life members or 50 ordinary members or more in a year.
5. Efforts should me made for more participation in the conference and attendance in the sessions. Half day sight seeing should be part of the conference program so that participants do not skip venue during the deliberations. .
6. A few posts in I L A should be reserved for younger members upto 30 - 40 years and women members and also SC ,ST members as per Indian Constitution and Registration of Societies Act .
7. E-groups can be formed within I L A members for professional discussions.
8. E-mail directory of the I L A members should be prepared .
9. A biographical index of I L A members may be published for better personal interactions.
10. I L A should obtain Income Tax exemption certificate under sub clause (iv) of clause 23 C of section 10 of the Income Tax Act, 1961 (43 of 1961) for the ILA membership and I L A conferences

registration fees and expenses towards T A and D A for the participants, if it has not already got it and should be notified along with the conference brochures and printed on receipts . It will increase the number of participants..

11. Division of I LA in various zones should be reorganised . Election method has to be reconsidered as postal ballot system is too costly. The term may be increased to 3 years.
12. Awards like Youngest Participant Award , Highest Number of Participation Award , Senior Most Participant Award ,etc. may be instituted.

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23

Degressive Attention Towards Information Services Necessitating Spontaneous Salvage Solution

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ABSTRACT

The nation's capacity to handle information resources effectively and efficiently depends largely on the integrated approach through technological innovations and their adaption and practical applicability at the apex institutions of higher learning. The authors discuss the present day trends in growing professionalism and find that it is apparently missing in the educational reforms. It is suggested that nation-builders and the planners enthuse the concerned bodies so as to achieve the cherished goals. Progress is possible through the recognition of professional services and the restoration of a congenial service environment for effective resource management.

1. THE EPOCH

Knowledge management has several embedded factors including human urge to tap the vast information potential and distribute it to the mankind through the learned channels. Retrieval of recorded information and its tremendous potential remain untamed and unutilised. Much of the information potential is yet to be tapped. There is an absolute dearth of trained professionals to process the vast resources and to put them to use. One should admit that the apathy of the Union government

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as well as of state governments in augmenting the resources has led to the present crises. The government established institutions of higher learning could not withstand the unprecedented growth in students population at the plus two and under-graduation and post-graduation levels. The budgets of the higher learning institutions are varying from 10% to 20% per annum and this downward trend jeopardised the higher education system in India and so also of the information resource managers the librarians and the information scientists.

2. THE TRAGEDY

The unbearable and mounting demand for more and more funds for the higher education institutions had led to the diminishing funding position. This has prompted the governments to accord approval to privately sponsored higher education institutions, institutions for plus-two stage education and several degree colleges for under-graduate studies. Even private universities are earning and self financing the educational activities. Similarly there is tremendous demand for professional courses at under-graduate and post-graduate level in engineerin and, medical education. These colleges, institutions of higher learning seldom respect the norms practiced by government-run institutions. This also applies to libraries and their maintenance.

The Constitution of India, makes higher education the responsibility of the Centre as well as of the states. However, coordination and realisation of standards in institutions of higher learning is exclusively the responsibility of the Centre, regulated through University Grants Commission. But very few institutions, both professional and non-professional under private managements, have full-fledged infrastructure like buildings, equipment and libraries. Many institutions are running their libraries for the name sake. They hold small collection of documents and appoint professionals on contract on limited wages. The higher education sector—sponsored, funded and maintained by Central government and state governments is no exception. It also dishonours its own norms regarding maintenance of libraries in colleges and universities as well. The situation as on today is quite deplorable and pathetic beyond imagination.

Table-1:Plan Allocations on Higher Education

1st plan	2nd plan	3rd plan	4th plan	5th plan	6th plan	7th plan	8th plan	9th plan
7.2%	5.8%	6.9%	4.9%	4.3%	2.7%	3.5%	4.5%	4.0%

Table-2:The Patterns of financial allocations to libraries in andhra Pradesh Universities 85-90

University	Expenditure on books	Expenditure on Journals	Expenditur on salaries other Serv.	Average Expenditure	Average Anaul Expenditre
Osmania University Hyderabad	10,54,034	9,30,905	19, 56,,071	39,41,011	7,88,202
Andhra university Vishakhapattanam	7,16,253	37,91,200	37,75,652	77,83,105	1,55,662
Sri Vanketaswara University, Hyd.	1,60,000	670838	2321862	3152760	630552
Jawahar Lal Nehru University Hy.	51000	286141	2712	339855	67971
University of Hy. Hyderabad	506892	3531147	1832680	5870720	1174144
Kaktiya University Warangal	193000	310000	545641	1048641	209728
Nagarjuna University Guntur	12000	807200	808055	1627255	325451
Sri Krishna Devaraya University Ananthapur	15000	624000	542040	1177040	235408
S.P. Mahila Viswa Vilyalaya Tirupathi	21671	55600	22622	99893	19978
Poui Sri Ramulu Teluge University Hyderabad	579600	88400	491891	1159891	231978

Table-3:Status of Vacant Librarian Posts in Degree Colleges in Andhra Pradesh 1999-2000

Sl. No.	Andhra Pradesh Region	No. of Govt. College	No. of Student in Govt. College	No. of Libra-rians	No. of Aided Degree College	No. of Student in Aided College	No. of Libra-rians	No. of Libra-rian Post Vacant
1.	Andhra Region	51	27991	37	85	112835	68	31
2.	Rayalaseema Region	60	36082	30	41	46861	26	45
3.	Telangana Region	58	46274	34	19	18553	13	14
4.	Hyderabad Region	7	6989	4	36	38434	25	30
	Total	**176**	**116736**	**105**	**181**	**21686**	**132**	**120**

3. THE IMPEDIMENT

Many a government run university in the country sans qualified professionals to man libraries leave aside their maintenance for offering minimum services. A casual look at the state of degree colleges in Andhra Pradesh and manpower deployment therein as depicted in the Table 3 would reveal the 'indifference' and 'apathy' of the concerned governments towards the basic services' and maintenance.

The state government of Andhra Pradesh in their orders have categorically stipulated that a qualified Librarian is essential for degree colleges and their affiliation to various universities in the state is conditional and subject to the fulfilment of various norms including the establishment and maintenance of degree college libraries. The statistics in the Table 3 shows that 357 degree colleges including government aided degree colleges have over 120 vacant positions of qualified and professional librarians. The **'apathy'** is clearly evident from the fact that out of 176 government run degree colleges 7 do not have librarians. Many a senior professional positions retirementof staff are becoming vacant and no action is initiated at any administrative level to fill these vacancies. When this is the state of government run college libraries, how could the government force privately

managed degree colleges to fill the librarian vacancies. If this is so, how is it possible to pay attention to library services, resource mobilisation and information dissemination? In the aided degree colleges in Andhra Pradesh over 49 librarian's positions are vacant out of 181 existing posts. Over 40% position are vacant in government run colleges, and over 27% in the aided colleges. This state of unfilled librarian positions indicates the importance bureaucrats and politicians attach to library and information in degree colleges.

It may not be out of to mention that many a degree college libraries run by government have annual budget not over few thousand rupees and the funds to update do not cross even one month's salary paid to a qualified librarian. A large cross section of the government aided degree college libraries seldom have any specified annual budget and the allocations are purely adhoc without any norms. This kind of pathetic situation in the matter of allocation of funds for library services indicates the wisdom, whatsoever, on the part of the administrative machinery in the higher education system in Andhra Pradesh. This pattern of apathy is not an isolated case in India. A casual look at the degree granting institutions across the country shows similar picture.

4. THE ENIGMA

The State Council of Educational Research and Training (SCERT) amalgamating various functions of the school education of the Andhra Pradesh Government does not fill up the librarian's post at the Council itself. This is despite its having the objectives to act as a clearing house for ideas and information and to keep the teacher educators and teachers abreast of the latest developments and provide academic guidance to the schools and undertake evaluative research studies etc. This example could be enough to understand what sort of patronage it is giving to fill up the hundreds of librarian's posts lyng vacant in schools for over several years.

The Andhra Pradesh State Council of Higher Education—an apex body which monitors the university education, research and standards is also without the post of librarian at its council. University libraries do not have professional heads for several years. Besides, the budgetary provisions of these state government

funded universities are also subjected to severe cuts. It may not be out of place to record, that not even one month's staff salary is being utilised on library books' acquisition, journal subscriptions and other document supplies. The annual budgetary provision of a state government funded university was Rs.2.10 lakhs for books, journals and other miscellaneous items and in fact the actual amount spent during the year 1999-2000 was Rs.0.93 lakh - whereas the recurring expenditure on salary alone crossed several lakhs of rupees. Are we progressing at this rate? Or denigrating to extinction?

5. THE UNIVERSITY DEBACLE

The state of university education system in India is also in doldrums and very little attention is being paid by the administrative authorities towards library services, and their improvement. The budgets are subjected to slashing annually and thereby the acquisition of journals, books and other documents are drastically cut to touch the rock bottom level . Thus there is hardly any scope for 'research' at any state government run universities in Andhra Pradesh as well as in many state government run university around the country. For instance, in the state of Andhra Pradesh, as many as 10 university librarian's positions out of 13 are vacant.

There is no dearth of professional talent in India to man the library services in universities and other higher education institutions. These 10 universities in Andhra Pradesh are directionless and are blind-folded since the in-charge personnel do not evince any interest in library services to the student community as well as research personnel and teachers and scientists. The governments have to pay greater attention to higher education system and establish information resources. This is essential to tap the hidden capabilities of our scientists.

6. THE PUZZLE

The high rate of population growth in India will have adverse effect on the existing resources and its impact will be enormous and disastrous. Unless the existing resources are exploited to their full potential, it would be difficult to handle the influx of new and additional students into the existing higher education system. It is high time to consolidate the available resources. In this

context it will be appropriate to press sufficient number of library professionals duly skilled in information, technology tools. Any further laxity on the part of the administrative machinery in the state and Central governments to plan the resource mobilisation would lead to catastrophes. The university libraries are the most coveted information treasures, rich in collections of books and other documents. The television world has been rightly exploiting virtual libraries to keep their audience abreast with relevant and nascent developments. They are telecasting programmes sensibly supported by valid and proven data. Much the same way the university libraries which possess the greatest treasures of knowledge could manage successively. The librarians by using of latest innovative technological features could emulate the culture of scientific approach and apply it to every aspect of research and development and thereby benefit the mankind. It is only the information scientists, who beyond any one's expectations, could lead the destiny through new discoveries and march forward.

7. THE POLICY BACKGROUND

The education policy of the Central and State governments should be explicitly implemented. The University Grants Commission streamlined the pattern of setting up a university in any state. The norms are detailed for filling statutory positions in a given university system - such as Vice-Chancellor, Registrar, Controller of Examinations, Finance Officer, Librarian and Physical Director. Likewise, norms for setting up a degree college or a junior college or equivalent are detailed by the concerned state governments, such statutory positions like Principal, Librarian, and Physical Director are indispensable in a collegiate environment. But alas! There is no government machinery employed to check whether the norms are being implemented effectively. The standards are diluted to such an extent that recovery would be difficult for any institution.

8. THE ENVISAGED PATTERN

The funding pattern for the institutions' maintenance and development does not evince any scientific base at any stage. **The funding pattern lacks any direction and the trend being adhocism** whereby fund releases are never honoured and as such the information world is badly affected. Likewise the statutory

positions such as librarians in colleges and universities are neglected causing thereby heavy loss to information management activity.

9. THE TRANSFORMATION

The university system of education has been transforming into distance mode. One should admit that the Indian standards of distance mode of higher education have contributed to substantial dilution of university libraries utility. While the methods of reaching masses under distance mode of education are appreciable, the importance of libraries should not be under-emphasised. The user community invariably throngs to library centres to enrich themselves with supportive knowledge available in various resources. The emphasis on norms to tackle the information explosion and on its utility in turning out professionally trained librarians and appropriate planning in this regard is the need of this hour. The funds for institutions of higher learning should be released from time to time giving due weightage to the total number of faculty members, research scientists and research scholars, students and to the goals and aims of the institution concerned. The role of librarian in institutions of higher learning is significant. Information enrichment through novel retrieval methods and by using appropriate technological means helps to serve the user community in a befitting manner.

10. CONCLUSION

The state of maintenance and development of university libraries in India is static and does not show any sign of change worth mentioning. It is not possible to move the government either. The day is not far off the learning community will demand an efficient education system in India from the political bigwigs, the planners and the executives. The restoration of the status and parity of the librarians by the University Grants Commission and Ministry of Education may have to be treated as a forlorn cry. Let us pray the wisdom would prevail upon the elders in the nation and they will meet the challenges of the society. The associations like Indian Library Association should break the ice to reach the ultimate. Let us join our hands to press for the freedom of education system so that we avail of its benefit and reach the greater heights of development.

24

Library Practices: A Study of Organisational Climate of University Libraries in Haryana

AJIT SINGH SIWATCH*

ABSTRACT

Organisational climate is one of the major components which determine the attitudes and behaviour of its members. This is a study pertaining to organisational climate of four university libraries in Haryana. The paper defines various facts of organisation climate and describes the dimensions of organisational climate on which the survey is based.

1. WHAT ORGANISATIONAL CLIMATE 1S?

Each organisation deals with its members in a variety of ways in the course of their employment. T0 obtain their cooperation in achieving organisational objectives, the management of all organisations must satisfy various needs of the employees. Through actions such as allocation of resources, reward and punishment, pattern of communication, mode of decision-making, style of leadership, and so on, an organisation influences the feelings, attitudes and behaviour of its members. In the course of time, such actions by the management acquire an enduring quality and results in creating a unique organisational culture or climate. As viewed by Baumgartel[2] (1971), organisational climate is a product of leadership practices, communication practices, enduring and systematic characteristics of the working relationship among persons and divisions of any particular organisation.

Forehead and Gilmer[3] (1964) define organisational climate as a set of characteristics that *(a)* describe the organisation and

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distinguish it from other organisations. *(b)* are relatively enduring over time and *(c)* influence the behaviour of people in the organisation.

Similarly, Tagiuri and Litwin[13] (1968) viewed organisational climate as a relatively enduring quality of the internal environment that is experienced by its members, influences their behaviour and can be described in terms of the values of a particular set of characteristics of the organisation.

Friedlander and Margulies[4] (1969) are of the view that organisational climate is a relatively stable or ongoing property of the organisation which may release. channel, facilitate or constrain an organisation's technical as well as human resources.

According to Taylor and Bowers[14] (1970) organisational climate is the perceived traits of organisational stimuli which become a group property through interpersonal interactions and which modify overt behaviour of people within the organisation. Akin to that of Taylor and Bowers, many others are also of the opinion that organisational climate is a set of attributes specific to a particular organisation that may be induced from the way the organisation deals with its members and its environment. For the individual member within the organisation, organisational climate takes the form of a set of attributes and expectancies, which describe the organisation in terms of both static characteristics (such as degree of autonomy) and dynamic characteristics (such as behaviour outcomes)

Payne (1971)[9] opined that organisational climate is a moral concept, reflecting the content and strength of the prevalent values, norms, attitudes, behaviour and feelings of the members of a social system, which can be operationally measured through the perception of system members or observational and other objective means.

Considering its important variables Pritchard and Karasick (1913)[10] described organisational climate as a relatively enduring quality of an organisation's internal environment, distinguishing it from other organisations, which (*i*) results from \he behaviour and policies of members of the organisation especially in top management, (*ii*) is perceived by members of the organisation, (*iii*) serves as a basis for interpreting the situation and (*iv*) acts as a source of pressure for directing activity.

Hellriegel and Slocum (1974)[5] state that organisational climate is a set of attributes which can be perceived about a particular organisation and or its subsystems and which may be induced from the way that organisation deals with its members.

The above definitions have a number of common elements such as (*i*) organisational climate is a molar concept; (*ii*) though subject to change, organisational climate is enduring over time; (*iii*) despite differences in individual perceptions, there can be broad overall agreement in describing organisational climate; (*iv*) when used in the form of summated, averaged perceptions of individuals, organisational climate is a characteristic of the organisation instead of the individual; and (*v*) organisational climate influences the behaviour of members of the organisation The term organisational climate as used in the present study, has all of these five sets of qualities and meanings.

2. DIMENSIONS OF ORGANISATIONAL CLIMATE

- Garlie A. Rorehand and B. Von Haller- (1964) identify five dimensions of Organizational climate: Structure Size; Complexity; Leadership Style; and Goal Direction.
- Newton Margulies (1965) identify the following dimensions of organisational climate which are prominently formed in various organisations, as 'A group characteristics' Disengagement; Hindrance; Esprit; Intimacy; Aloofness; Production Emlphasis; Thrust; Consideration;
- On the similar pattern. G H Litwin and RA Stringer(1968) isolated and discuss as many as nine dimensions of organisational climate, which are: Structure; Responsibility; Reward; Risk; Warmth; Support; Standards; Conflict; Identity;
- R.J.House and J.R. Rizzo (1972) identified the fourteen dimensions of the organisational climate in their research These are: Timely Decision-Making; Upward Information requirement; Top Management Receptiveness; Induction and/ or Promotion of Those Outside the Organization; Formalization; Selection Criteria Based on Ability; Job Pressure; Subordinate Development; Team Work; Intergroup Cooperation; Chain of Command; Information; Distortion; and Suppression; General Communication; and Definition

of Work.

Similarly, Robert D. Pritchard and Bernard Karasick (1973) identify ten dimensions of organisational climate, which are found in different organisations. These are: Autonomy; Cooperation; Supportiveness; Structure; Reward Structure; Performance-Reward Relationship; Achievement Motivation; Status Polarization; Flexibility; and Decision Centralization.

On the same pattern, John E. Newman (1977) discussed ten dimension of organisational climate naming them as: Supportive Style; Task characteristics; Performance-Reward relationship; Co-worker Relations; Employee work Motivation; Equipment and Arrangement of People; Employee competence; Decision Making Policy; Work Space; Job Responsibility/Importance.

The following dimensions of organisational climate of the university libraries were identified and put within this study.

2.1 Structure

Deals with structure of authority and relationships among persons and groups. The feeling that employees have about the constraints in the group; how many rules, regulations, procedures are there; the emphasis on red-tape and going through channels. It also deals with the degree to which superiors established and communicated a job's objectives and the methods for accomplishing them and the degree to which the library authority specified the methods used to accomplish the tasks.

2.2 Responsibilities

Deals with the degree to which employees see responsibility as part of their job and the work as necessary to successful operation of the library. It also deals with the feeling of being your own boss; not having to double-check all your decisions; when there is a job to do, knowing that it is your job.

2.3 Reward

Deals with the feeling of being rewarded for a job well done and emphasising positive rewards rather than punishments. The perceived fairness of the pay and promotions based on performance and the degree to which rewards are fair and

appropriate is also included in it.

2.4 Risk

Deals with the sense of risk and challenges in the job and in the organisation. Wheather there is an emphasis on taking calculated risk or is "playing it safe" the best way to operate.

2.5 Warmth

Indicate the feeling of general good fellow feeling that prevails in the working group atmosphere; the emphasis on being well-linked; the prevalence of friendly and informal social groups.

2.6 Support

Deals with the perceived helpfulness of the librarians and other employees in the library and emphasis on mutual support from above and below.

2.7 Standard

Deals with the perceived importance of implicit and explicit goals and peformance standards; the emphasis on doing a good job; the challenge represented in personal and group goals and performance.

2.8 Identity

Deals with the feeling that you belong to an institution and you are a valuable member of a working team.

3. OBJECTIVES OF THE STUDY

The study is carried out with the objectives to find out the level of availability of eight prevalent dimensions of organisational climate (*i.e.* Structure; Responsibility; Reward; Risk; Warmth; Support; Standard; and Identity) in all the four selected university libraries of Haryana state.

4. LIMITATIONS OF THE STUDY

This research endeavor has been completed by an individual and therefore, certain constraints like time, financial resources, and sufficient authority to collect the required information, are always there. To highlight a few, it may be mentioned that the inferences drawn are based primarily on the perceptions of the respondents and the observations made by the author. And thus, like other

Social Sciences, the limitations of perceptions of the subjects and also the prejudices of the author in making observation always influence the rationality of interpretations, though, through observations, the author has tried to compare the two situations *i.e.* the information recorded by the observational units in the schedule and the actual dimensions of organisational climate practiced by the staff of the selected libraries. For the purpose of generalisation of inferences in the survey, sample libraries from different states of the country should have been included, but due to time, financial and personal limitations, only four university libraries functioning in the state of Haryana have been selected. Pertaining to actual practices of organisational climate dimensions, however, the author had tried to unearth the reality either by putting counter questions or by observing the behaviour of the staff of the libraries. Despite these limitations, the author, with his sincere efforts, has tried to find out the significant conclusions on the subject of the study.

5. SPHERE OF STUDY

The main survey was conducted during the period of 1996 to 1999 and the study is confined to the university libraries located in the state of Haryana. The university libraries in india are many and they differ from one another. The geographical areas are also so widespread that it is very difficult to cover them in one study. And thus, only one state was selected for the study. During the period of investigation, study of four university libraries have been made in the state of Haryana, which are rich in their collection, provide better and effective services and have a healthy organisational climate.

6. SAMPLE SURVEY

The sample for the present study has been drawn from all the four university libraries of Haryana (*i*) Nehru Library, Ch. Charan Singh Haryana Agriculture University, Hissar (ULI); (*ii*) National Library In Dairy, National Dairy Research Institute (Deemed University, ICAR), Karnal (UL2); (*iii*) Jawaharlal Nehru Library, Kurukshetra University. Kurukshetra (UL3); (*iv*) University Library, Maharashi Dayanand University, Rohtak (UL4).

Table-1: Data Summary Regarding the University Libraries Under Study

Library code	UL-1	UL-2	UL-3	UL-4
Name of the University library and address (date of establishment)	Nehru Library CCSHAU Hissar (1970)	National Library In Dairy National Dairy Research Institute, Deemed University (ICAR), Karnal (1955).	Jawaharlal Nehru University Library, Kurukshetra University Kurukshetra (1956)	University Library Maharshi Dayanand University, Rohtak - Haryana (1976)
Type of University	Agricultural Science University	Deemed University (University level institution in Dairy development)	State University (General)	State University (General)
Type of Library	Agricultural University Library	National Library in Dairy	University Library	University Library
Size of the Staff (Total)	90	21	91	86
Professional	10	5	16	28
Semi-Professional	28	5	20	10
Other Staff	52	11	55	48

7. QUESTIONNAIRE

A modified version of Litwin and Stringer's (1968) Organizational Climate Questionnaire was used to tap the respondents' perceptions of the organisational climate. The climate questionnaire was modified after the modification done by Schnak (1983), Shanna (1987), Ansari (1990)[1] with the idea that removing the effective component from responses to an organisational climate questionnaire would improve the discriminate validity of the instrument and would lead to a more objective measure of occupational climate of the library. For the present study the following eight dimensions of organisational climate were selected. The structure, responsibilities; reward; risk; warmth; support, standard; and identity.

Table-2 : Library Climate

Sr. Nos	Dimensions of Organizational Climate of University Library	Total Item
1	Structure	2
2	Responsibility	3
3	Reward	4
4	Risk	2
5	Warmth	3
6	Support	1
7	Standards	7
8	Identity	1
	Total Items	23

The subjects were given a set of 23 statements to measure the eight dimensions of organisational climate concerning their their perception and observations about thc library in which they have been working. They rated each item on a 5-point scale: 1= strongly disagree (SD), 2 = disagree (D); 3 = indifferent (I); 4 = agree (A); and 5 = strongly Agree (SA), the extent to which it was true for their respective libraries. Few negative statements have also been included in the schedule which give the reverse degree on the scale i.e. I = strongly agree (SA). 2=agree (A), 3 = Indifferent (I), 4 = disagree (D), 5 = strongly disagree (SD). To measure the structure dimension of organisational climate of the libraries two items were selected. Similarly to measure responsibility, reward, risk, warmth, support, standards, and identity three, four, two, three, one, seven and one items have been included in the schedule respectively. All the 23 items were mixed in such a way that the respondents could not identify which items were related to which dimension (Refer to Table 2)

8. ORGANISATIONAL CLIMATE IN UNIVERSITY LIBRARIES

To picturise the prevalent organisational climate in all the four university libraries selected for the studies, a separate (Section B) has been included in the schedule. To isolate the relevant item pertaining to the organisations climate,we have used a modified version of Litwin and Stringer (1968), Schnake (1983) and Ansari

(1990) organisational climate questionnaire. The climate questionnaire was modified with a view to remove the ineffective component from the questionnaire and also to try tc improve the validity of the instrument, which they lead to a more objective measurement of the organisational climate. Respondents were given a set of 23 single item statements concerning their perceptions and observations about the organisation in which they have been working for the purpose. Eight dimensions(*i.e.*, structure, responsibility, risk, warmth, support standards, reward, and identity) of organisational climate were identified and measured on 5 point scale (strongly disagree through strongly agree) to the extent these were found in their organisations. The distributions of items for different dimensions of climate are summarized in the Table-3. along with positive statements. Some statements are also included in the schedule which measured on 5 point scale but in a reverse order *i.e.* strongly agreed through strongly disagreed.

Table-3: Dimensions of Organizational Climates and Distribution of items

S.No.	Organizational Climate	Sr No of item	Total Items
1	Structure	1,10(NS)	2
2	Responsibility	7,12(NS) 23	3
3	Risk	3(NS), 6	2
4	Warmth	9(NS), 14(NS),20	3
5	Support	15(NS)	1
6	Standards	2,5,11,16,18,19(NS),21	7
7	Rewards	8(NS), 13, 17, 22	4
8	Identity	4	1

NS = Negative Statement

The scores of the items pertaining to the items of the organisational climate dimensions were calculated and then these were converted into percentage score by taking 100 as base score. The perceptions of two category of respondents (librarians and their colleagues) have been tabulated and analyzed separately.

9. UNIVERSITY LIBRARIANS' PERCEPTION

Table 3.1 gives the over-all view of the perceptions of the

librarians regarding all dimensions of organisational climate prevalent in all the four university libraries. The librarian of UL 1 perceived that in his library structure, standards, responsibility, warmth and identity dimensions of organisational climate are the most prevalent as the obtained score for these dimensions are 80 and above. Similarly, he was found indifferent about the availability of risk and reward dimensions of organisational climate and the only dimension not found in his library was support. The table shows that the organisational climate of the UL 1 is of 'high structural and high-standards climate' as these two dimension are ordered in first and 2nd ranks.

Librarian of the UL2 considered that structure, identity, warmth, reward, standards, support and risk taking dimensions of organisational climate are there in his library. The only dimension for which he was perceived to be indifferent was responsibility. The ranking order of the Table 3.2 describe that identity and structure dimensions of organisational climate are the most dominant dimensions in the library. The support, identity, reward, responsibility, standards and structure are the dimensions which have provided strength to UL3 and warmth and risk are the dimensions about which either the librarian was found indifferent or negative. Based on rank order in each dimension of organisational climate, this library could be considered as very comfortable on account of support and identity dimensions.

The librarian of UL4, describes that warmth, identity, risk, reward and standard dimension of organisational climate are the pillars of his library. However, he was found indifferent regarding structure and responsibility, but he was sure that support is lacking in his library and which needs to be strenghtened. In the overall ranking it could be stated that the library is well endowed with warmth and identity.

If, we focus on aggregate score pertaining to each dimension then it may be found that identity, structure, standards, warmth, reward, responsibility and risk dimensions are inexistence in all the four libraries whereas, about support dimensions, the respondents are uncertain. After analysing the responses of the librarians about the organisational climate prevailing in their libraries, it could be summarised that these are well equipped with identity and structured dimensions.

Table-3.1: Prevalent Organizational Climate as Perceived by the Librarians

(Max Base Score =100, N=4

Orgionisational Climate	UL 1		UL2		UL3		UL4		Combined	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Structure	100	1	100	1.5	70.0	6	60.0	6.5	82.5	2
Responsibility	86.7	3	60.0	8	73.3	4	60.0	6.5	70.0	6
Risk	60.0	6.5	70.0	7	60.0	7	70.0	3.5	65.0	7
Warmth	80.0	4.5	93.3	3	53.3	8	80.0	1.5	76.6	4
Support	40.0	8	80.0	6	80.0	1.5	40.0	8	60.0	8
Standards	91.4	2	82.9	5	71.4	5	68.6	5	78.6	3
Rewards	60.0	6.5	90.0	4	75.0	3	70.0	3.5	73.8	5
Identity	80.0	4.5	100	1.5	80.0	1.5	80.0	1.5	85.0	1

Subordinates' Perception

According to the perception of the subordinates of UL1 support, risk and warmth dimensions of climate are not in existence in their library whereas they are confident about the availability of identity, responsibility, structure, standards and reward dimensions of climate. As exhibited in Table 3.2 the ranking order also explains the same situation.

The completion response of subordinates belonging to UL2 depict that the library is inadequate in forms of support, and warmth dimensions of the climate while it is rich as far as identity, structure, standards, reward and responsibility dimensions of organisational climate are concerned.

Table-3.2: Prevalent Organizational Climate as Perceived by the Subordinates

(Max Base Score =100, N=57

Orgionisational Climate	UL 1		UL2		UL3		UL4		Combined	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Structure	73.0	3	80.0	2	77.4	2	72.9	2	75.8	2
Responsibility	74.0	2	74.3	4	68.8	6	67.9	3	71.3	3
Risk	59.0	6	62.9	6	64.2	7	51.0	7	59.3	6
Warmth	56.7	7	59.0	7	70.9	4	50.8	8	59.4	7
Support	48.0	8	51.4	8	43.2	8	53.3	6	49.0	8

Orgionisational Climate	UL I		UL2		UL3		UL4		Combined	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Standards	71.1	4	74.7	3	71.6	3	66.5	4	71.0	4
Rewards	68.0	5	64.3	5	70.5	5	56.4	5	64.8	5
Identity	96.0	1	91.4	1	85.3	1	73.3	1	86.5	1

The subordinates of UL3 opined that excepting the support all other dimensions are prevalent in their library as they obtained score ranking between 64.0 per cent to 85.0 per cent.

As per the percentage and and rank analysis, in UL4, warmth, risk, support and reward dimensions of organisational climate were missing while identity, structure, responsibility and standards dimension were found in existence.

The overview of the study of the university libraries showed that support, warmth and risk were the three dimensions of the climate which were not found and the existence of five dimensions of the climate (*i.e.* identify, structure, responsibility standards and reward) have been confirmed by the subordinate staff of all the four university libraries in Haryana.

10. ORGANISATIONAL CLIMATE

The effect of organisational climate which seems to be associated with both the styles of leadership and influence strategies, another analysis pertaining to dimensions of the organisational climate and their association with leadership style and influence strategies, was conducted and summarised in Table 5.

Table-5: Popularity Order of Dimensions of Organisational Climate

Popularity	Dimensions of Organisational Climate
Most Popular	Identity
	Structure
	Standards
Popular	Warmth
	Reward
Least Popular	Responsibility
	Risk
	Support

The Table depicts that identity, structure and standards are the dimensions of the organisational climate of the university libraries, which appear to be the most popular. In contrast, reward responsibility, risk and support are the least popular variables of organisational climate. It shows that the identity of the library and the staff, standards and structure of the library are the important dimensions of the organisational climate which are most prevalent in the libraries and are included in the sample. When the author was discussing with respondents on reward, support, risk and responsibility variables of dimensions of organisational climate, the respondents freely disclosed that those who work hard will get more work, others get reward. This is also clear from the study that reward, responsibility, risk and support climate is not popular in these university libraries.

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25

A Study on Working Conditions of College Librarians

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ABSTRACT

Sustainable human resource development is a recent concept which is applicable to the field of Library and Information Science. It emphasises the working condition and quality of working life of personnel in an organisation. Hence, this study proceeds to find out the type of building, provision of certain facilities like separate cabin, provision of air-conditioning, and attendents. Factors like quality of work and job satisfaction among academic librarians are studied. Relationship between age of respondents and job satisfaction is found. It also tries to establish relationship between "quality of job" and "working condition". Finally, it brings out other problematic issues at working place.

1. INTRODUCTION

Sustainable human resource development is a recent concept that finds application in Library and Information Science. UNDP in its Country Co-operation Framework (1997-2001) laid special emphasis on Sustainable Human development (SHD) as an important strategy for India's development goals. The first step is the formulation of the guiding principles for integrating SHD concerns into the programme support documents (PSD). Among the three macro principles for the formulation of PSD, the first one is: 'Put people and their well being at the centre of the programme support

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rationale'. The contemporary concept in management for putting people and their well being together is 'quality of working life'.

In an international conference held at Arden House, New York in 1972 the term, 'Quality of Working Life' (QWL) was coined to integrate the various approaches to the designing of work systems and general climate of work. Since then, the QWL concept and its values have spread to many countries of the world.

2. THE CONCEPT

Quality of working life (QWL) is one aspect of HRD. The QWL is a broad and general concept which includes the subject experiences of workers. By QWL, Van Beinum[1] emphasises 'the quality of the content of relationship between men and his task – as simple and as complex as that'. According to Guest[2], 'it is a generic phrase that covers a person's feelings about every dimension of work including economic rewards, benefits, security, working conditions, organisations, and interpersonal relations and its intrinsic meaning'.

Human Resource Development (HRD), besides many things, gives attention towards creating a home environment in the work-place where the workers gain an assurance of being cared for in the most personalised manner. According to Walton, there are nearly eight conceptual categories that contribute to the QWL and the first one being 'Quality of working environment'.

There are a number of schools of thought about enhancing life in the workplace starting with the 'human relations management' of Mayo and Mcgregor, the 'job enrichment' of Herzberg, the 'socio-technical systems' of Thorsrud and Davis, and finally the one with the general catch-all phrase, 'quality of working life'.

3. SCOPE OF THE STUDY

This study involves some important aspects of QWL in the case of librarians working in 40 academic libraries in and around Trichy city. In the study, the term 'working conditions' as it implies to librarians is used to refer to physical environment in the workplace, and nature of relationship with higher authorities, co-workers and users. It also tries to assess job quality and job satisfaction.

4. HYPOTHESIS

(*i*) There is a significant relation between the age and job satisfaction of the respondents.

(*ii*) There is a significant relation between the quality of work and job satisfaction

5. DATA ANALYSIS AND INTERPRETATION

5.1 Personal Details

A total of 40 librarians constituted the sample population for the study. Majority of the respondents (75%) were males as shown in the Table 1.

Table 1: Gender-wise Break-up

	No. of Respondents (Total = 40)	Percentage
Male	30	75.0 %
Female	10	25.0 %

Table 2: Age-wise Break-up

Age Group In Years	No. of Respondents (Total = 40)	Percentage
20-29	16	40.00 %
30-39	13	32.50 %
40-49	5	12.5%
50 and above	6	15.0%

Majority of the respondents belong to the youthful age group, 20-39 years (72.50%).

5.2. Working Conditions

Under the type of working conditions one aspect is the type of building where the library is accommodated. Library is important because the librarian / users are going to spend most of their time there and it is also the place where the process of exchange of information takes place.

Table-3: Conditions of Library Building

Condition of Library Building	No.of Respondents (Total = 40)	Percentage
Good	13	32.5 %
Fair	17	42.5 %
Bad	10	25.0%

The above Table indicates that the majority of the respondent librarians are satisfied with the condition of their library buildings with a total of 75% giving a certificate of 'fair' to 'good'. Rest 25% are not having good library buidlings.

Table-4: Library Facilities

Particulars	**Number of respondents having the facility**
Sufficient Chairs / Tables	75.0%
Separate Librarian cabin	22.5%
Availability of A/C	7.5%
Attenders / Assistance	58.0%

The above Table shows that some of the facilities available in libraries. 75% of them say that there are sufficient chairs / tables in the library. "Status" is sometimes determind in terms of certain facilities given to a professional, for example cabins, attendents, car etc. Of the respondents, only 22.5% have separate cabins but majority of them (77.5%) do not have this facility. Again, only 7.5% have A/C facilities. Librarians should have attendents or assistants, but it is unfortunate that many librarians (42.00%)are handling the library alone.

Table-5: Working conditions

Opinion on work--ing conditions	No.of Respondents (Total = 40)	Percentage
Extremely good	10	25.0%
Good	10	25.0%
Fair	12	30.0%
Bad	8	20.0%

According to the above Table, 25% of the respondents agree that the working condition is "Extremely good" and another 25% say that it is good. Altogether it is seen that half of the librarians studied are of the opinion that the library working conditions are satisfactory. Only 20% are experiencing bad working conditions.

5.2 Quality of Job

Table-6: Quality Level of Job

Quality of Job	No.of Respondents	Percentage
High Quality	26	65.0%
Not High Qaulity	14	35.0%

The above Table shows that 65% accept that there is a high quality job and 35% say it is not so. If a person has a high quality job, *i.e.* a challenging and interesting job, that job will also have other good work factors and it may lead to high job satisfaction. This again, all other things being equal, leads to happiness and hope for the future. The people with high quality jobs are also likely to have better health, high life expectation, and self-actualisation.

The above Table shows the total working condition of librarians. Thus, studies have shown that QW (Quality of work) and QWL (Quality of life) have a relationship[3].

5.3. Satisfaction at Work

Table-7: Job Satisfaction

Job Satisfaction	No.of Respondents (Total = 40)	Percentage
Yes	25	62.5%
No	15	37.5%

It is clear from the above table that majority of the librarians (62.5%) are satisfied with their job.

5.4. Age of Respondents and Job Satisfaction

Table-8: Age and Job Satisfaction

Sl.No.	Age of Respondents Years	Job Satisfaction	
		Yes (n = 25) No. of Respondents	No (n = 15) No. of Respondents
1.	20-29	8 (20.0%)	8 (20.0%)
2.	30-39	11 (27.5%)	2 (5.0%)
3.	40-49	3 (7.5%)	2 (5.0%)
4.	50 and above	3 (7.5%)	3 (7.5%)

Thus the calculated value of x^2 is 4.125. Degree of freedom = n-1, i.e. 4 -1 = 3. For 3 degrees of freedom at 5% level of significance the table value is 7.82 which is much higher than the calculated value (4.125) of x^2. Thus the hypothesis is accepted.

Table-9: Working Condition and Quality of Job

Sl.No.	Working condition of respondents	Quality of Job	
		Yes (n = 26) No. of Respondents	No (n = 14) No. of Respondents
1.	Extremely good	7	3
2.	Good	6	4
3.	Fair	9	3
4.	Bad	4	4

The above Table indicates the comparison between the quality of job and working condition.

The calculated value of x^2 is 0.875. Degrees of freedom (n=1). i.e. 4 -1 = 3. For 3 degrees of freedom at 5% level of significance, the table value of x^2 is 7.82, which is much higher than the calculated value (0.875) of x^2. Thus the hypothesis is accepted.

6. FINDINGS

(*i*) Working condition is reported to be 'good'or 'extremely good' for 50% of the respondent librarians whereas it is bad for just 20% only.

(*ii*) 65% of the respondents say that their job is considered a high quality job.

(*iii*)Majority of them *i.e.*, 62.5% are satisfied with the job.

(*iv*) There is a significant relation between the age and job satisfaction.

(*v*) There is a significant relation between the quality of work and job satisfaction.

7. OTHER ISSUES

When librarians were asked to comment on any other problems, the feedback included two very important issues namely "uniformity" of pay scale in all self-financing colleges and the problem of "loss of books" during stock-taking. Other issues included *(a)* lack of attendents / assistants *(b)* allocating other work like teaching, official (office) work, etc. *(c)* working hours being too long *(d)* not being treated at par with teaching faculty, etc.

8. CONCLUSION

There is a lack of concern for tackling human resource development in the library field. A constructive approach is to be adopted in handling this issue. One should remember, that the success of an organisation considerably depends on the quality of personnel employed. If the personnel are put in a congenial environment and working condition, the target can be achieved. This is possible through periodical review of the organisation for further action. Thus, the working environment should be reviewed and steps are to be taken for improvement.

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Measurement of University Library Services: A Case Study of Karnatak University Library, Dharwad

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ABSTRACT

The paper highlights the measurement of library services as the best practice to optimise the utilisation of information resources. The data on use of resources for the period of 30 months, collected from the maintained records of the Karnatak University Library, Dharwad is analysed systematically. Also, the paper provides correlation analysis of the data of books consulted within premises of the library and the books loaned out. It is observed from the study that the books borrowed in largescale are the heavily used books.

1. INTRODUCTION

A university library supports learning, teaching and research activities of its parent institution. While making use of its different resources such as collection, personnel, machines and materials and also to support the different programmes of the university, the library is going to render variety of services to users including administrators. Another important function of the university library is to know whether the collection made available and the services rendered have satisfied the user community or not. Therefore, the library services should be evaluated regularly to determine how users are making use of these resources through conducting regular user surveys in the library. These kind of

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surveys not only helpful the library to know the strength and weakness of the collection, services etc., they also inform the authorities about the status of the library.

So far the surveys conducted in the Western universities have helped the authorities of the university in general and the university librarians in particular not only to understand the quantitative and qualitative services rendered by the libraries but also what are the future needs and requirements of the clientele. This type of the studies also help in collecting the data related to all kinds of activities and services and the opinion of the users.

Circulation is one of the services provided by any type of library, through which certain type of library resources can be loaned to users for home use. A well-maintained circulation statistics may be useful in collecting the data and the same data have been traditionally used as an indicator of library activity.[1]

2. PURPOSE OF THE STUDY

The purpose of this study is to determine the use of the collection at the Karnatak University Library and also is an attempt to find out if there is correlation between the subject group of books used in the library and those loaned out to users over a period of 30 months (From 1999 to 2001 August).

3. METHODOLOGY

An observation method has been used to collect the data related to use of books by the users within the premises of the library every day between 8.00 a.m. to 9.00 p.m. The books used by the users were counted before shelving the documents. The parameters used to find out the types of books consulted in the library is the reading materials left on tables by these users after their consultation. The same method has been used to know the subject and category-wise use of books in the library. The data related to books loaned out is gathered while using the records maintained in the circulation section of the library.

4. KARNATAKA UNIVERSITY

The Karnatak University, which has celebrated its Golden Jubilee in 1999 is the second oldest and one of the large universities with 276 affiliated colleges and 96,945 students in its jurisdiction of seven districts in Karnataka state. In addition, the university has

7 faculties encompassing 45 departments of Post-graduate teaching and research with 314 teachers and 3,759 regular Post-graduate students and more than 500 regular Research Scholars. The university, over the last fifty years, has built up a reputation of its own, nationally and internationally, as a seat of learning known for its well-disciplined students and scholarly faculty. Recently the National Assessment and Accreditation Council (NAAC) has evaluated and awarded Five Star status to Karnatak University.

The main objectives of the university are to impart higher education and to conduct research in all branches of knowledge. A number of research projects are being undertaken in various disciplines and the university holds a prestigious collaboration with the DRDO of the Government of India and other national bodies like CSIR, UGC, AICTE, DST, and SAP etc. Situated on a gently sloping hillock with sylvan surroundings, the Karnatak University campus is endowed with a unique natural beauty spread over a vast area of more than 800 acres.[2]

5. UNIVERSITY LIBRARY

The university library was established along with the Karnatak University. It started functioning from 1950. Since its inception the library adopted the open access system. During the dynamic leadership of Dr. D.C. Pavate the then Vice-chancellor, the library has witnessed a tremendous growth and was hailed as a progressive centre of learning. The Handbook of Indian Universities (1963, p.200)[3] has praised the university library as "This University has some progressive ideas as may be seen in the development and running of the library".

The library was shifted to its new independent building in July 1981. Library has a total carpet area of and 41,500 sq. feet and can accommodate 300 readers at a time. There are 24 cubicles for research scholars.[4] The library was designated as a UNO Depository Centre in 1967. At present the centre has over 23,000 volumes. This is one of the heavily used and always crowded sections of the library.

5.1 Book Collection

The library has in stock of more than 3.3 lakhs of volumes covering a wide variety of subjects. It acquires every year about 3,000 new titles. It has around 50,000 back volumes of periodicals and receives over 450 periodicals (both Indian and foreign) of general and subject specific nature.[5]

Table-1 Total Collection of the library

Year	Documents in Stock	Total Collection
1999	Books in stock	3,29,065
	Back Volumes of Journals	54,778
	Theses & Dissertations	5,256
	UNO Documents	20,545
2000	Books in stock	3,31,904
	Back Volumes of Journals	56,103
	Theses & Dissertations	5,594
	UNO Documents	21,829
2001	Books in stock	3,32,675
	Back Volumes of Journals	55,637
	Theses & Dissertations	5,423
	UNO Documents	22,854

5.2 Inter-library Loan

Table-2

Year	No. of Documents borrowed through ILL	No. of Documents sent through ILL to other libraries	Introduction letters issued to student to other libraries	Introduction letters received from outside student to library
1999	97	67	163	103
2000	123	89	172	112
2001	64	42	67	34

5.3 Classification

The library has adopted the Colon Classification, which divides all knowledge into 55 main classes. The Arabic numerals from 1 to 9, 3Y5, and 9S the 26 letters of the English alphabets, 5 Greek letters and nine combinations of the English alphabets *viz.*, BX, CT, GV, HZ, KZ, LZ, NZ, XT and YZ are used to denote these classes.[6]

6. REVIEW OF LITERATURE

The circulation means annual total number of items charged out for use, usually (although not always) outside the library, includes initial charges, renewals, and general collection and reserves (which may be separated). Most libraries count circulation on an ongoing basis. It is important to ensure that all units in the library are using a consistent definition. Frequently the circulation count is considered as workload figures, and items charged to internal library units (*i.e.*, reserves, bindery, mending, cataloguing) are included in the statistics.[7]

The circulation statistics is an aspect of performance indicators, which try to evaluate library performances and services. One of the basic responsibilities of a librarian is improving services to users by analysing circulation and other kinds of uses. Librarians and Information Officers must have information on their stock, their readers and library usage in order to maximise the impact of the services.

Proponents of circulation studies argue that the use of any item in a collection is the most valid measure of those items worth to the library and that the problems of collection development must be considered in the context of collection evaluation. Stephen and Hornby assert that with the studies of their circulation data, University libraries may answer several questions such as what part of the collection are used? How often are materials used? etc.,

Calculate circulation per capita by dividing circulation by the number of users group. Automated circulation systems may provide detailed information about circulation by user group by segments of the collection.

Before automation was applied to record keeping in libraries, the analysis of circulation was based upon drawing samples. As

described by Jain(1966, 1969)[8,9] two approaches were possible: the collection sample and the checkout sample. The former involves selecting a random sample of items from the entire collection or from selected subject areas, usually through use of the shelf list, locating the books involved and plotting their circulation history from the earliest use to the present. This was the method used by Fussler and Simon (1969)[10]. While all the collection is needed to account for all of the use, it appears that about 60% of the use is accounted for by only about 10% of the collection and 80% of the use seems to come from about 20% of the collection.

The use of automated systems permits an analysis of circulation patterns based upon extensive data collected over a considerable period of time. The most complete study of this type was performed on circulation data for 86 months gathered at the Hillman Library of the University of Pittsburgh (Kent et al. 1979)[11].

6.1. In-House Material Use

Circulation data do not give a complete picture of the collection and its use because they fail to take into account the use of materials within the library. This may not be too important in the case of a public library, but it is most important in academic and research library, where in-house use may greatly exceed circulation.

A library will usually do table counts for only a very limited period of time because of the resources needed to record data on items used before they are returned to the shelves (Shaw, 1978). [12]

Some people have undertaken detailed study in the field of In-library Material use, it means total number of items used in the library but not charged out. Libraries have traditionally counted circulation of materials. However, simply counting circulation underestimates the total use of the library.

Recently, libraries have also begun to count in-library use of materials in several ways; [13]

- By asking users not to reshelf materials used in the library (Kent and others, 1979; Van House and others, 1987)[14]
- By observing users' behavior and counting their uses (Wenger and Childress, 1977)[15]

- By asking users how many materials they used during their visit (Rubin, 1986)[16]
- By placing questionnaires in selected materials, asking users who find them to complete them (Taylor, 1976/77)

Metz and Litchfield (1988)[18] and McGrath (1971)[19] found fairly high core-relations between circulation and in-house use in large libraries for the entire collection. They concluded that circulation and in-house use are similar but not identical.

7. LIBRARY BEST PRACTICES

The term 'Best Practice' encompasses the extent of the implementation of quality framework and the use of benchmarking and performance measurement as tools for the continuous improvement of products, process and services.

7.1 Quality

Quality of services is an ongoing concern for university libraries. Indeed, 'the single most important challenge before the university librarian is constructive change and improvement in library performance'. Improving performance requires information about how good the performance is currently, plus feedback on the success of efforts to improve. [20]

7.2 Benchmarking

Benchmarking is now regarded as a useful and appropriate tool for improving products, processes and services despite past perceptions of it as a tool for business/industry/organisations. Almost all of Western university libraries reported their involvement in benchmarking exercises over the past few years.

A range of benchmarking methodologies have been used, the choice depending on institutional goals and objectives, size and structure and the type of process identified for benchmarking. Examples of using common survey instruments to extract comparable data with the aim of process improvement include: [21]

- Services
- Collections
- Materials Availability
- Costing Core Processes
- Users Satisfaction
- Staff Satisfaction

- Multi-dimensional Profiling
- Information Handling skills
- Management

Indian universities appear to be very vaguely conscious of protecting the integrity of their institutions and retaining competitive advantage than in the western countries where there are less formal exchanges of views. Co-operation on new initiatives for a greater good are preferred to benchmarking. The UK and US pattern of dominance of benchmarking and other initiatives by newer universities keen for a competitive advantage is not generally the case in India.

7.3. Performance Measurement

Performance measurement is universally practiced a part of the management process in university libraries. The Performance measurement activities should be a continuous process in the organisation, not only from the point of view of the continuous change in the environment, the ongoing competition for authority of the organisation and the struggle for diminishing resources. Evaluation must always be connected with the goals of the organisation and the goals, again, must be viewed against the larger context of the social, economic, cultural and political reality. This also involves that user surveys cannot be excluded from any kind of Performance Measurement, because the measurement is intended to support the activity of the organisation and explaining the results, or 'telling stories or making sense of the figures', is an essential part of the evaluation.

7.4 Staff Competencies

Indian university libraries have embraced quality improvement initiatives with enthusiasm. The training and competencies required for staff to work effectively with the tools and techniques have not always been addressed to the same degree. Libraries with ongoing training programmes which address quality management techniques and related skills are rare, yet the presence of integrated in-house staff development programmes appear to be one pre-requisite for a really effective framework implementation in a large institution. It is recognised that a significant investment of resources is required for successful staff development. Training support is more likely to be in place where the institution has

dedicated staff with some specific responsibility for quality, staff development and training.

8. ANALYSIS AND INTERPRETATION OF THE CIRCULATION STATISTICS

Statistics on the general circulation at the Karnatak University library have been recorded daily for five decades. These statistics have been used in the past mainly for preparing annual reports, which are usually presented to the university authority. But, for the first time an attempt has been made to look into the records and see how these could be used in determining the pattern of use of the existing stock so as to establish any correlation between those used in-house and those borrowed.

Table-3. Number of Users visit the library, Books Consulted and Issued Out

Month year	Total users visit library	Per day (Ave.)	Books Cons. (Faculty wise)	Per day (Ave.)	Books issued (PG Students & Research. Scholars	Per day (Ave.)	Books issued to Teachers & other staff	Per day (Ave.)
Jan.99	9,919	331	47338 Sc. 23,752 SS. 15,150 Hu. 7,432 Or. 1,004	1527	4650	155	4292	143
Feb.99	11,082	396	49,545 Sc. 26,623 SS. 14,845 Hu. 7,542 Or. 1,663	1,174	5,692	203	4428	158
Mar.99	12,260	395	52,384 Sc. 27,232 SS.15,315 Hu. 7,693 Or. 2,144	1,690	8,486	273	4,526	146
Apr.99	13,347	445	58,645 Sc. 28,348 SS.16,869 Hu. 9,632 Or. 3,796	1,955	8,637	287	4,742	158
May.99	16,425	530	41,358 Sc. 19,538 SS. 14,262	1,334	5,283	170	4,468	144

			Hu. 6,436 Or. 1,077 18,263					
Jun.99	5,231	174	Sc. 8,154 SS. 5,961 Hu. 3,721 Or. 311	609	2,032	65	2,361	76
			24,638					
Jul.99	5,347	172	Sc. 11,537 SS. 7,043 Hu. 3,953 Or. 817	795	3,523	114	3,043	98
			29,426					
Aug.99	5,864	189	Sc. 13,841 SS. 9,061 Hu. 5,865 Or. 659	949	4,205	103	2,264	73
			45.663					
Sep.99	8,865	295	Sc. 22,632 SS. 12,962 Hu. 8,183 Or. 1,886	1,522	11,234	441	2,638	88
			51,262					
Oct.99	9,875	319	Sc. 25,728 SS.14,161 Hu. 9,258 Or. 2,116	1,654	12,206	426	2,852	92
			62,847					
Nov.99	10,125	337	Sc. 28,847 SS. 17,452 Hu.12,143 Or. 4,328	2,095	12,542	451	2,962	99
			73,265					
Dec.99	11,352	336	Sc. 35,162 SS. 20,121 Hu.13,260 Or. 4,722	2,363	13,851	447	4,805	155
Total	**1,19692**	**328**	**5,54,634**	**1,520**	**92,314**	**253**	**43,381**	**199**
			81,423					
Jan. 2000	12,650	408	Sc. 37,234 SS. 25,315 Hu. 13,848 Or. 5,026	2,627	11,256	511	4,131	133
			85,628					

Feb. 2000	12,847	459	Sc. 38,341 SS. 28,635 Hu. 14,682 Or. 3,970	3,058	12,793	457	4,364	172
Mar. 2000	14,435	466	92,483 Sc. 41,237 SS. 31,645 Hu.15,142 Or. 4,459	2,983	13,306	439	4,285	138
Apr. 2000	12,286	410	95,643 Sc. 42,143 SS.31,948 Hu.16,261 Or. 5,291	3,188	14,232	474	3,997	133
May. 2000	6,392	206	51,347 Sc. 21,631 SS.14,535 Hu.10,126 Or. 5,055	1,656	6,425	207	4,526	146
Jun. 2000	3,752	125	23,545 Sc. 10,263 SS. 7,861 Hu. 3,472 Or. 1,723	776	2,892	96	3,208	107
Jul. 2000	4,653	150	25,834 Sc. 11,654 SS. 8,475 Hu. 4,026 Or. 1,679	833	2,765	89	4,423	143
Aug. 2000	7,837	253	38,647 Sc. 18,463 SS. 12,148 Hu. 6,845 Or. 1,191	1,247	8,382	270	2,558	83
Sep. 2000	8,241	275	56,842 Sc. 28,164 SS. 14,268 Hu.11,016 Or. 1,191	1,895	11,262	375	3,284	109
Oct. 2000	9,495	306	63,462 Sc. 28,246 SS.19,165 Hu.12,148 Or. 3,903	2,047	5,658	183	3,361	108
			71,463					

Nov. 2000	9,863	329	Sc. 34,645 SS. 21,041 Hu. 12,138 Or. 3,639	2,382	7,687	256	3,858	129
Dec. 2000	12,347	398	87,641 Sc. 38,423 SS. 27,843 Hu.15,218 Or. 3,639	2,827	8,029	259	4,491	145
Total	**1,14,798**	**315**	**7,73,778**	**2,120**	**1,04,984**	**288**	**46,486**	**127**
Jan. 2001	12,826	414	89,436 Sc. 39,642 SS. 28,925 Hu. 16,362 Or. 4,507	2,885	10,031	324	5,141	166
Feb. 2001	13,263	474	92,832 Sc. 40,148 SS. 32,261 Hu.17,232 Or. 4,329	3,315	11,324	405	4,625	165
Mar. 2001	13,789	445	94,541 Sc. 41,226 SS. 32,261 Hu.17,012 Or. 3,828	3,050	12,613	407	4,268	138
Apr. 2001	14,247	474	96,439 Sc. 42,132 SS. 33,182 Hu. 17,344 Or. 3,801	3,215	12,913	430	4,076	136
May. 2001	14,869	480	49,347 Sc. 24,347 SS.14,043 Hu. 9,139 Or. 1,923	1,592	7,146	231	3,464	112
Jun. 2001	4,347	145	22,648 Sc. 10,324 SS. 7,438 Hu. 3,162 Or. 1,724	755	2,038	68	2,814	94
Jul.	3,139	101	19,432 Sc. 9,164 SS. 7,318	627	1,478	48	1,027	33

2001			Hu. 2,036 Or. 914					
Aug. 2001	5,835	195	37,367 Sc. 18,203 SS. 10,864 Hu. 6,314 Or. 1,986	1,205	6,843	221	2,106	68
Total	82,315	339	5,02,042	2,066	92,608	381	27,521	113

The Analysis of Table -3 shows that within the period (30 months) considered 1,19,692 (1999), 1,14,798 (2000) and 82,315(2001 up to August 31st) users visited the library and 5,54,634(1999), 7,73,778(2000) and 5,02,042 (2001) books were consulted by users of different faculties such as Science, and Technology, Social Science, Humanities and others, also 92,341(1999), 1,04,948(2000) and 64,386(2001) books were issued for home reading to students and at the same time 43,381(1999), 46,486(2000), 27,521(2001) books were issued out for reference to teachers and other members of the library.

Totally, on an average, more than 300 to 350 users have visited the library and more than 2000 books were consulted within the premises of the library as well as 350 to 400 books were issued from the circulation desk every day.

Table-4. Issue of Books (Subject wise): Year: 1999

Class No.	Subject	Books issued to PG and Ph.D. students	Per day (Average)	Books issued to Staff (teaching and Non-teaching	Per day (Average)
2	Library and Inf. Science	3,162	9	962	3
9S	Computer Science	4,845	13	1,031	6
3Y	Journalism and Mass Communication	1,878	5	1,262	4
A	Natural Science	973	3	379	1
B28	Statistics	2,629	7	1,325	4
B	Mathematics	4,261	9	1,182	36
C & CT	Physics and Electronics	5,635	16	3,936	11
D	Engineering	968	3	321	1

E & E9G	Chemistry and Bio-Chem.	6,326	18	3,624	10
F	Technology	338	1	182	1
G	Biology	3,231	9	2,281	6
H	Geology	1,134	3	1,024	3
I	Botany	3,682	10	1,624	9
J	Agriculture	1,832	5	643	2
K & K867	Zoology and Sericulture	3,824	11	1,628	5
L, LA&LM	Medicine, Ayurveda and Homeopathy	1,024	3	836	2
M & MY	Useful Arts and Physical Education	842	2	382	1
?	Mysticism	346	1	183	1
N & N8	Fine Arts & Music	382	1	104	1
O	Literature	7,326	20	2,662	7
O33	Kannada Literature	10,260	28	6,860	19
P	Linguistics	2,034	6	865	2
Q	Religion	1,868	5	936	3
R & R365	Philosophy and Yoga	1,210	3	827	2
S	Psychology	2,845	8	903	3
S	Research	926	3	486	1
T	Education	964	3	327	1
U	Geography	2,528	7	947	3
V	History	2,624	7	1,017	4
W	Political Science	2,182	6	1,038	4
X, XT&X:56	Economics, Commerce and Management	5,324		152,165	
Y, Y15 and Y:45	Sociology, Women Studies Work and Criminology	3,371	9	1,243	4
Y7	Anthropology & Soc. Work	2,142	6	968	3
Z	Law	425	1	128	1
1999	**Total**	**92,341**	**253**	**43,338**	**119**

Year : 2000

2	Library and Inf. Science	2,732	8	1,024	3
9S	Computer Science	5,825	16	1,238	3
3Y	Journalism and Mass Communication	2,125	6	1,182	4
A	Natural Science	835	2	315	1

B28	Statistics	2,864	8	1,426	4
B	Mathematics	4,836	13	1,347	4
C & CT	Physics and Electronics	6,826	19	3,262	9
D	Engineering	972	3	382	1
E & E9G	Chemistry and Bio-Chem.	6,921	19	3,262	9
F	Technology	341	1	191	1
G	Biology	2,263	6	1,328	4
H	Geology	2,028	6	1,006	3
I	Botany	3,864	11	1,726	5
J	Agriculture	1,921	5	672	2
K & K867	Zoology and Sericulture	3,824	11	1,728	5
L, LA&LM	Medicine, Ayurveda and Homeopathy	1,128	3	843	2
M & MY	Useful Arts and Physical Education	946	3	421	1
?	Mysticism	356	1	187	1
N & N8	Fine Arts & Music	382	1	104	1
O	Literature	9,265	25	3,643	10
O33	Kannada Literature	12,623	34	6,923	19
P	Linguistics	2,332	6	845	2
Q	Religion	1,874	5	942	3
R & R365	Philosophy and Yoga	1,241	4	837	2
S	Psychology	2,945	8	1,426	4
S	Research	942	3	443	1
T	Education	982	3	365	1
U	Geography	2,685	7	1,124	3
V	History	3,,826	10	1,643	5
W	Political Science	3,184	9	1,428	4
X, XT&X:57	Economics, Commerce and Management	5,628		152,547	
Y, Y15	Sociology, Women Studies	3,283	9	1,528	4
Y7	Work and Criminology Anthropology and Social Work	2,864	8	1,043	3
Z	Law	321	1	105	1
2000	**Total**	**1,04,984**	**288**	**46,486**	**127**
	Year : 2001(Up-to August 31, 2001)				
2	Library and Inf. Science	1,241	5	462	1

9S	Computer Science	5,123	21	2,126	9
3Y	Journalism and Mass Communication	1,625	7	626	2
A	Natural Science	321	1	192	1
B28	Statistics	1,435	6	924	4
B	Mathematics	2,526	10	1,247	5
C & CT	Physics and Electronics	3,924	16	1,647	7
D	Engineering	403	2	132	1
E & E9G	Chemistry and Bio-Chem.	3,847	16	1,215	5
F	Technology	106	1	63	1
G	Biology	2,107	9	1,038	4
H	Geology	1,243	5	642	-
I	Botany	1,546	6	843	3
J	Agriculture	834	3	341	1
K & K867	Zoology and Sericulture	2,638	11	947	4
L, LA&LM	Medicine, Ayurveda and Homeopathy	843	3	426	2
M & MY	Useful Arts and Physical Education	421	2	203	1
?	Mysticism	123	1	82	1
N & N8	Fine Arts & Music	136	1	65	1
O	Literature	5,847	28	2,403	10
O33	Kannada Literature	8,943	37	3,846	16
P	Linguistics	942	4	403	2
Q	Religion	864	3	443	2
R & R365	Philosophy and Yoga	648	2	384	1
S	Psychology	1,434	6	841	4
S	Research	425	2	82	1
T	Education	481	2	123	1
U	Geography	1,214	5	633	2
V	History	2,527	10	847	3
W	Political Science	2,241	9	824	4
X, XT & X:5	Economics, Commerce and Management	3,865	16	2,025	8
Y, Y15 & 7:45	Sociology, Women Studies Work and Criminology	2,526	6	943	4
Y7	Anthropology and Soc. Work	846	3	427	2
Z	Law	141	1	76	1
2001	**Total**	**64,386**	**265**	**27,521**	**113**

It is clear from the Table -4 that, the maximum number of books

borrowed in the subjects like Language and literature classes O and O33 (Kannada and English) stood at top level, within two and half years period 22,438(English), 31,826(Kannada) books were borrowed by Students. At the same time 8,708(English) 17,629(Kannada) books were borrowed by staff. It clearly shows that, the literature and regional language (Kannada) books were attracted by all types of users.

It is followed by Class E (Chemistry and allied subjects such as Bio-Chemistry, Physical Chemistry, Organic and Inorganic Chemistry etc.,) as the second largest used classes with 18,094 and 8,101 books were borrowed by students and staff respectively.

Class C and CT (Physics and Electronics) as the third largest used classes with 16,385 and 8,845 books borrowed by students and staff respectively. In the other classes such as 9S(Computer Science), X, X:5, and XT (Economics, Commerce and Management) and Y, Y15, and Y:45(Sociology, Social Work, Criminology, Anthropology etc.,) books were borrowed by students and staff more or less in the same manner.

8. FACTORS RESPONSIBLE FOR THE USAGE PATTERN

The pattern of books usage that has emerged from the analysis of the circulation statistics of Karnatak University library can be linked to following the factors. One of such factor is the regional language (Kannada) and the medium of the instruction is in English. The second factor is students' strength in the faculties like Sciences and Technology and Social Sciences are larger than that of the faculty of Humanities. Departments such as Master of International Economics and Business (MIEB), Master of Business Administration (MBA) Master of Library and Information Science (MLISc), Master of Computer Science Application (MCA), Commerce, Law and some of the new interdisciplinary subjects such as Biochemistry, Microbiology, Biotechnology, Genetics, Information Science, etc., are now the hot favourite disciplines for students. It is, therefore, expected that with such teeming user strength, the materials to be used by the students will be extensively good.

Ideally, the number of books consulted in any library should be greater than the number of those issued for home use simply because the total number of volumes should be such that even if every student borrows that stipulated number of books, there will

always be enough number of copies which can be consulted within the premises of the library.

However, it is pertinent to show why the number of books loaned out within two and half years was only 3,79,099(390 per day), as against 18,30,454(1,881 per day) were consulted, both by students and staff. The reason for this as identified from the library record is that majority of the students did not register their name in the library and they cannot enjoy the borrowing facilities. The other interesting reasons are that the students are depending heavily on the senior students notes, and on the Guides prepared and sold to them by private local publishers. These Guides and notes have more or less used as substitutes for library books, especially by the students in the in the faculties like social sciences and humanity. Another important reason is that, the photocopying facility also reduces the number of books borrowed from the library and to some extent Electronic Sources *i.e.* Internet Sources etc.

9. CONCLUSION

It is clear from the analysis that, the use of the book-stock in the Karnatak University library has a correlation exists in the pattern which of usage of the stock. The breakdown of the data into subject areas shows that, the subjects mostly consulted are the one mostly borrowed. In the years ahead, circulation statistics will continue to be employed in evaluating various services in the library. University and other academic libraries in India must not regard circulation statistics as a mere routine, but must be analysed from time to time so that projections can be made for the future while deficiencies hitherto unnoticed can be corrected. Periodical evaluation of the circulation statistics not only indicates re-organisation of the system but also gives new dimension to the library services.

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28

Performance Evaluation as a Tool for Quality Service in Government Library-A Case Study

KEYA BASU*

ABSTRACT

The paper attempts to evaluate services of Eastern Region Library of Geological Survey of India, Kolkata. A study was conducted to ascertain the users' viewpoint regarding its efficiency, collections, services, personnel, and physical facilities. Data were collected through questionnaire, personal observation of the functioning, services and facilities of the library and examination of relevant files and records maintained in the library. Two types of questionnaire were distributed,one for user feedback and another for library personnel. It concludes that a library system needs to be analysed periodically for task relating to quality evaluation, decision making, priority setting, planning of future activities and services.

1. INTRODUCTION

In India systematic investigation for minerals began with the search for coal by the British Government which later crystallised into what is known as Geological Survey of India (GSI), in March 1851. From coal it expanded to essential minerals and now it supports research on almost every aspect of geology. It is needless to mention that minerals form the backbone of nation's economy and Geological Survey of India plays an important role in strengthening our nation. The multiple activities of GSI are supported by laboratories and scientific literature. Hence, almost all the offices of GSI, across the country maintain a library. The author's study is limited only to Eastern Regional library of GSI at Kolkata. This library has been serving its users for nearly 40

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years. It has a vast collection of geoscience periodicals, books, reports, records and other publications. Most of users consist of geologists, geophysicists, geochemists within the GSI and also from allied organisations.

2. OBJECTIVE

Liberalisation of economy has exposed GSI, like other organisations of the country, whether it is public or private, to new challenges and increased competition from global multinationals and domestic players as well. To gain a competitive edge it has become imperative for GSI to redefine its goals and priorities. It has become imperative to focus on acquiring, organising, processing and disseminating the right information at the right time and also to build up a comprehensive database on geological information. Here lies the importance of a departmental library. At present it is operating in an environment where availability of resources is inversely related to demand for quality service and the picture is not different in case of GSI, ER, library. The effect of any financial crunch is also reflected in the library. As competition for resources becomes intense, we must convince our managers of the importance of continuing to provide resource to the library. We have to justify the resources the library demands and demonstrate that the benefits derived are worth the expenditure. Our library's aim is to provide pertinent and timely information in an efficient manner, which enables the organisations to excel. Though this library has been providing services for 40 years, there has never been any attempt to assess the services it provides. Besides, there are other reasons also which have prompted the author to take up this study, but the most vital reason can be summed up in one word—survival. If we, the library professionals do not provide up-to-date and accurate information on time the users may take other ways to meet their information needs which may result in undermining the importance of the library.

3. METHODOLOGY

To assess performance of our library we visualised the library as model of a series of processes. Like in any other library, acquisition, processing and services are the main functions of this library, so the different elements in the model are defined as follows:

- Inputs : Staff, materials, funds, which are put into the library's operation.
- Outputs : The direct product of library's activities. These are quantified in terms of number of issues and returns, number of reference queries answered, books/publications classified and catalogued and so on.
- Outcomes : These are the uses made by the clientele of a given output and the degree of satisfaction with those outputs. These are measured in terms of specificity, timeliness, complexity etc.

The most common method of assessing a library's performance is to compare outputs with inputs. The relationship between outputs and inputs provides two types of information. Firstly, one can get information from user's point of view, how efficiently an operation is carried out. Secondly, the relationship between outputs and inputs can be used to generate information on the productivity of different services.

3.1 Input

In case of this library input elements are:

Present staff structure:

Designation	No.
Librarian	1
Sr. Asstt. Librarian	1
Library Information Asstt.	3
Non- professional staff	1
Auxiliary staff	2

Total collection :

Books	Journal titles	Unpublished reports	GSI publications	Maps
6520	67	18023	2485	135

Expenditure in Rupees:

Items	1999-2000	2000-01	2001-02
Books purchased	2,00,000	2,85,000	2,50,000
Annual journal subscription	14,00,000	14,65,000	15,50,000
Hardware/software and library equipment	3,30,000	3,30,000	2,05,000

3.2 Output

The library of Geological Survey of India, Eastern Region, provides the following services:

- Circulation service;
- Reference service;
- Referral service;
- SDI service;
- CAS service;
- Bibliographic service;
- Online search service;
- Reprographic service;
- Newspaper clippings

The reports of library activities are maintained month-wise. These reports are prepared in a data sheet form. It is a conventional method of assessing performance of a library. A great deal of performance data are obtained from these data sheet. Since the library is not fully automated, the library professionals by means of simple counts and observations obtain these data. Collecting data has become a routine job for the library professionals. These monthly reports include number of readers visiting the library, number of queries answered, number of issues/returns, number of documents processed etc.

3.3 Outcome

Much of the information required for evaluation of ef. ctiveness of services can only be obtained from users themselves. Like monthly report of activities, user feedback cannot be obtained frequently because any method which involves, asking users for their views is time consuming. In addition too frequent surveying

may lead to 'questionnaire fatigue' on the part of those being surveyed. So we generally try to maximise the benefit derived from user surveys by only asking for that sort of information which is not possible to acquire from any other source.

Questionnaire is the most commonly used tool for acquiring feedback from users. We are also using it to get feedback from our users. The questionnaires were distributed mainly to the scientists of the Eastern Region, GSI. Here, we have also used another type of questionnaire for our library staff to ascertain their views, if they are satisfied with their job, pay package, promotional facility etc.

At the time of designing questionnaire we were also careful about four basic rules of questionnaire design:

- ask only those questions which are capable of being answered
- ask the minimum of required information;
- ask only those questions which can be realisti cally answered;
- ask only those question which users will be prepared to answer.

4. ANALYSIS

4.1 Users Feedback

The questionnaire for library users generated a response rate of 71%.

4.2 Major Findings

Resource: On analysis of the data it has been found that 55% of total respondents feel that the collection of the library is serving their purpose effectively and 50% said that periodicals are adequate enough to satisfy the requirement pertaining to their work. 70% said that holding of the unpublished reports of GSI fulfilled their needs and 90% feel that stock of GSI publications served their purpose satisfactorily.

Service: Books and journals are kept on racks for open access. User can browse and select his/her required documents. Unpublished reports and GSI publications are not open to users. However, 85% said that the holdings of the library are easily accessible. However, 65% respondents preferred to have their required documents through library personnel. 80% respondents

are satisfied with conventional card catalogue system. At the same time they opined that it would be better to have a computer terminal in the reading room or reference desk to get information about availability of a particular document or its issue status, etc. Regarding non-availability of required documents, 60% respondents said that it occurs rarely, 20% said very rarely and experience of the remaining 20% is not so good. There is a computerised unpublished report database in the library and searching experience from this database is satisfactory for 45% users. Unfortunately 30% users were unaware of this computerised service. 75% of the total respondents' experience of present bibliographic service is good.

All of the respondents said that the existing reprographic facility is very poor and needs improvement. Overall impression about the library service is good for 60% respondents and 20% felt it is excellent and 15% said that the services provided by the library personnel are excellent but infrastructure is not good.

Infrastructure: The location of the library and opening hours suits almost everyone. All of them suggested for improvement of the reading room. 60% respondents felt that reading room should be located separately within the library and others suggested that it should be within books and journalaria. 85% suggested for improvement of the study environment of the reading room and 90% preferred a spacious reading room. Regarding computerisation, all of them said that total computerisation of library activities is very much essential and Internet facility should be provided within the library.

The questionnaire for library personnel generated a response rate of 60%. Of the total respondents 66% feel that they can work in the library freely even though all of them mentioned that infrastructure was not sufficient and agreed that without professional skill, it was not possible to work in this library.

The survey also reveals that the professionals are very much interested to help user and derived satisfaction from it, at the same time they feel that the users are not fully satisfied with the services. The resources of the library are partially utilised due to lack of proper infrastructure, lack of utilisation of available manpower and lack of proper orientation programme. All of them have suggested that the present circulation system be changed.

The survey rewards that the job satisfaction of the library professionals is highly below the expected level. They expect better pay package and better prospects in service. All of them feel that their higher educational qualification is not getting proper recognition. The present authorities are not serious about the growth factor of the library. The professional expertise of library personnel has not been tapped by the authorities. There is no attempt by the higher ups to utilise the 'science' of library available in their division, Other than classification/cataloguing of books and journals and file works.

Inference:

- The collection of books and journals is not adequate for the scientists to meet their needs. It is expected that the authorities will provide sufficient funds to procure books and journals.
- Resource sharing and networking among GSI libraries, all over India is very much needed to derive maximum benefit of the resources available in other GSI libraries.
- For better use of the existing library materials, there should be regular user-library interaction to acquaint users with the different services of the library.
- Steps should be taken to create better study environment. Library reading room should be ergonomically designed. Proper care should taken in respect of physical facilities in terms of space, lighting, furniture etc.
- Computerisation of total activities of the library is very much needed to provide effective and timely information to users.
- Computers and communication systems have brought about a revolutionary metamorphosis in the dynamics of library system. Considering this, the library personnel should be given training to take up the challenge of information technology. There should be provision for effective in-service training.
- Steps should be taken towards maximum utilisation of available manpower in the library.
- Survey reveals that the users are very much satisfied with the services of the library personnel. They feel that the personnel are helpful prompt but lack of infrastructure

affects their service adversely.

- Better service prospects should be provided to motivate personnel and to improve efficiency.
- Library personnel have taken some special course in library and information science to provide a service suitable for a scientific library, unfortunately it is not in the agenda of authorities. Many users do not even realise that a library personnel is different from others clerical staff.
- It is a paradox to expect library services on modern lines when no authority is given to introduce improved system.

5. CONCLUSION

In the harsher economic climate, which exists today, where competition for resources is fierce, there is an increasing acceptance that libraries must demonstrate their value in measurable ways. This attempt will help library managers to assess libraries according to the good they do through the effectiveness and efficiency of their services. Periodical assessment of a library system is important for the library manager as it aids in decision making in areas such as resource allocation, priority setting and in planning future activity. Planning is an on-going activity and planning for collection development, services and new facilities should receive major attention.

29

Ensuring Quality of Library and Information Science Courses through Distance Education

SAVITA MITTAL*

ABSTRACT

The formal education system was not sufficient to meet the increasing demands for education, hence the concept of distance was introduced. But the quality of courses in this mode of education must be maintained especially in professional courses. The present paper seeks to examine the main determinants of quality assurance in library and information science programmes through distance education.

1. INTRODUCTION

Every country has come to realise the need for educating most of its population. It is also recognised that the formal system of education is not sufficient in meeting the increasing demands for education. This led to the search for alternatives. Instead of bringing students to seats of learning it was proposed to take schools to the students, and hence this concept of distance education came into existence. It was considered to be an alternative method of education, to enable a large segment of the population to acquire further knowledge and professional competence. The concept was introduced to meet the specific

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needs of those students:

- Who are living in the remote areas
- Who do not desire to join conventional institutions
- Who had earlier discontinued their formal education due to some unavoidable circumstances
- Who feel that education should be a continuous process and they like to update and refresh in their knowledge in an existing discipline or to acquire knowledge in a new area.

Open education in a term that has been used inter changeability with distance education. It has been described as "arrangements to enable people to learn at the time, place and space which satisfies their circumstances and requirements." While distance education refers to the process of learning in which there is spatial and usually temporal distance between the teacher and the learner. On the other hand open education refers to the process of making learning avialble to a learner at a place and time of his/her and at a rate suitable to the learner.

2. KEY ELEMENTS OF DISTANCE EDUCATION

The key elements in delivering this mode of education may be listed as follows:

2.1. Printed Material

This consists of correspondence notes, pamphlets, books and teach yourself manuals. This printed material forms, perhaps the most important part of the learning process of distance education.

2.2. Audio Visual Aids

These include slides, films and videotapes and interactive CD-ROMs.

2.3. Radio and Television

Mass media can be used to broadcast and telecast the learning programmes. This helps in creating a sort of classroom away from the campus in the home. This also permits a kind of structured reading cum assignment programme.

2.4. Computer Aided Learning

It is also an indirect learning method and is used extensively.

2.5. Study Groups

This provides informal face to face interaction among learners who can mutually come to understand their difficulties and helps to save these. The degree of contribution of above described key elements varies from programme to programme and institute to institute.

3. PROFESSIONAL PROGRAMMES THROUGH DISTANCE MODE

Today many professional programmes are being run through distance education apart from the general courses. These are related to:

- Management
- Computers
- Library Science
- Accountancy
- Teaching etc.

The objective of any professional programme is to build up professional knowledge and competencies of a learner. Library and information science, being a professional programme is intended to develop the skill of a learner in a scientific organisation of the library collection and its timely delivery to the users. The role of library and information professional has totally been changed in the present day society with the application of information and communication technologies. They are no more library professionals rather they are called information professionals. Different universities, institutes, schools etc. are offering library and information science programmes through distance / correspondence mode at different levels such as Certificate Course, Diploma Course, Bachelor's degree, Master's degree etc. in Library and Information Science. The objectives of offering library and information science programmes through distance education are mainly due to the fact that these:

- Provide access to higher educational opportunities to the professionals which is not possible for them through formal programmes.
- Helps those who are living in remote areas and cannot join the regular courses. Moreover, provide the facilities to complete their courses at the learners' study centres.

- Improve the quality and capabilities in understanding organisation and management of library and information centres.
- Helps the professional in career advancement schemes by acquirinng the professional qualification

4. DETEMINANTS OF QUALITY ASSURANCE IN LIBRARY AND INFORMATION SCIENCE PROGRAMMES THROUGH DISTANCE EDUCATION

4.1. Eligibility for the Course

To maintain the quality, first and formost consideration is to fix the eligibility for admission to each course, *i.e.*, Certificate, Degree, Masters degree, M. Phil degree, doctorate degrees etc. in Library Science. The eligibility criteria must be equal to those for regular courses run by the different universities/institutes. The main constituents of eligibility are:

i. Educational qualifications

ii. Percentage of marks / division

iii. Experience / Training in libraries

iv. Age

Moreover, experience of training for libraries is very essential for library and information science programmes through distance education. Experienced persons should be preferred.

4.2. Size of Enrollment

Strength of the students must be pre-decided and kept within limts to maintain the quality of the courses.

4.3. Selection Procedure

The entrance test followed by interviews in the best practice to have good candidates for admission to different courses in library science.

4.4. Designing of Course Curriculum

While offering the different level programmes, the design of the course curriculum must be taken into consideration. This needs to be carefully planned and the learning outcomes in terms of understanding, knowledge, application and skills of the distance learners should be reflected by the Curriculum. Course curriculum

must be revised and kept up to date. The library and information science must give emphasis on the fundamentals of library management, bibliography and reference service, classification and cataloguing, collection development, information and documentation with emphasis on information technology. The distance learners must be given theoretical and practical background of computer application and practical handling of the libraries. More emphasis is to be given on collecting, organising, processing and disseminating information with the help of modern computer and communciation technology. Application of information technolgies in the libraries and information centres enable the learner to develop his or her computer skills for its effective organisation. These will help the professionals in:

- Making library automated and other computerised operations
- Designing databases, searching databases and using readily avialable software packages
- Searching of CD-ROM bibliographic databases
- Multimedia application in libraries
- Organising information resources available on internet
- Preparation of online search strategies

4.5. Infrastructural and Other Facilities

Infrastructural facilities are important for quality assurance. The host institute and the distance education centres should ensure the facilities such as sufficient classrooms, computer laboratories, resource persons etc. Library must have a good collection on library science including reference and autio-visual material and computers and softwares related to library science, sufficient computers must be provided for the access and practice of the students laboratories and libraries must be opened for quality of delivery of programmes effectively to the distance learners.

4.6. Course Material

The course material must be provided on all topics covered by the course contents. The contributors / authors must be highly qualified, experienced and well known in the field of library science. They must have practical as well as theoretical knowledge of the field. The material must be despatched to the students at a proper time before personal contact programmes.The non-printed material

should also be provided to the students at the nearest centres in form of audio-video tapes, CD-ROMs, databases, bibliographie etc. They must have access to Internet, computers, multimedia and video text etc. for quality assurance.

4.7. Resource Persons

The resources persons for personal contact programme should comprise of reputed faculty and senior professionals drawn from different universities and should have high quality of theoretical and practical knowledge in the area of his/her specialisation. They must keep themselves up-to-date in his/her area and related fields.

4.8. Training to the Counsellors

Another aspect of implementing Library and Information Science programme is to train the counsellors for distance education preparing for counselling and pseronal contact programmes (PCP) as well as evaluating the assignments of the distance learners. Strong motivation on the part of the distance learners makes them successful in completing the programmes in which counsellors are the mediators between the university and the learners.

4.9. Personal Contact Programmers (PCP)

Contact programmes play a significant role in the learning process through distance education system. Contact programmes being run for library science are having two types of classes. First, they run theory classes for theoretical subjects. Secondly, they run practical classes for classification, cataloguing, refernece services, computers etc. During PCP, difficult topics and complex functions must be clarified and the learners must get adequate theoretical and practical inputs.

4.10. Additional Student Support Services

Once a programme is launched, a student attached to a particular study centres supposed to get all types of support services like counseling, library facilities, submission of assignments and its evaluation, watching audio-video programmes, conducting practicals, seminars, teleconferencing etc. Students support services need to be strengthened such as timely delivery of study material, counselling, library and computer facility, audio-video programmes, teleconferencing, national telecast programmes, evaluation of assignments etc. Various problems of student both

academic and adminstrative in nature should immediately be attended so that a learner is motivated to complete his or her programme in time.

4.11. Review of the Courses and Follow up Activities

Course review activities mainly depend upon the feedback made available to regional centres and in turn to head-quarters. A review document is required which outlines a timetable for receiving feedbacks as well as various areas under which feedback is to be received.

4.12. Establishing Standards for Distance Education Programmes

A committee is needed for the promotion, coordination and maintenance of standards in distance education in India. The committee should consist of national experts in the field of Library and Information Science. It should develop the norms and standards for Certificate, Diploma, bachelor degree, Master's degree, M.Phil degree, Doctorate etc. through distance education. These norms must pertain to the course curriculum, annual intake, eligibility, conselling, student support services, faculty requirements and other infrastructural facilities that as are very essential for the library and information science programmes. Quality can be assured if these norms are properly followed by the distance learning institutes.

5. CONCLUSION

Thus, to achieve the quality in education through correspondence courses the institutes must keep in mind the above cited determinants especially in all the professional courses. Morever, today in the modern age information technology has also played an important role to improve the quality especially in case of distance learning. The distant learners must have accesss through their study center for internet facilities, audio-visual materials, CD-ROMs, databases, multimedia instructionals package etc. as these packages are more interesting and effective for the distance learners.

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30

Measuring E t Performance for Quality Human Resource De lopment : An Analysis of the Papers Contri ted in I L A Conferences

S . KUMAR *
LEENA SHAH **

ABSTRACT

This paper analyses the papers contributed at I L A Conferences from 40th to 46th and a Seminar held at Vadodra during the period Jan.1995 - Jan.2001 and their authorship pattern. Provides tables and analyses types of authorship and papers contributed. Analyses authorship pattern, female contributors, statewise distribution of authors and their affiliations. It calculates scores of individual authors and finds top rank authors on the basis of number of articles contributed and scores obtained separately on the basis of a formula developed for this purpose. Suggests parallel sessions during conferences and multi volume publication of papers. Also suggests for more awards.

1. INTRODUCTION

An association is known by its activities for developing professionalism among its members and professionals and caring for their interests at all levels. The presentation of an article in a conference promotes quality in practice. Paper presentation before a group of people, interested in the topics, and discussions on the issues make research more valuable. Discussion on the various topics assures "Quality for Best Library Practices". I L A is regularly holding annual library conferences and a few occasional seminars. Pre-conference publication of the papers is a significant

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feature of the I L A which allows participants to discuss the papers in the house and make resolutions for future action. This certainly has good impact on the profession and improves quality and status.

So far many bibliometric studies have been made on journals in various fields but we have not come across any paper on bibliometric study of annual conferences, especially of I L A. This study will certainly have great impact on future policies for quality for best practices of Indian Library Association.

2. AIMS AND OBJECTIVES

The study has the following aims and objectives.

(*i*) To find out basic data about articles published,

(*ii*) To find out authorship pattern ,

(*iii*)To know geographical distribution of authors ,

(*iv*) To find out affiliation of authors ,

(*v*) To prepare rank order of authors on the basis of number of papers contributed.

(*vi*) To study scores of individual authors and prepare rank orders,

(*vii*)To know participation of female authors.

(*viii*)To study the papers which have received "Best Paper Awards and Award of Commendation".

3. METHODOLOGY

The study is limited to 7 conferences 40th-46th and a seminar held in 1999 at Vadodara to cover period from Jan.1995- Jan.2001 (From Panaji to Ahmedabad). For the study, actual volumes have been consulted and an author indexes of individual volumes have been prepared along with a cumulative author index for these volumes . These index are available with the authors and and are proposed to be published soon. While preparing author indexes each conference is marked with a code starting from G to N so that similar author indexes for 35th to 39th I L A conferences can be cummulated in it to cover the period from 1990 . Each author has been marked with a specific sign for analysis purpose.

4. ANALYSIS

On the basis of data collected from above stated 8 pre - conference/ seminar volumes, analysis has been done with the help of various tables prepared.

4.1 Papers Contributed

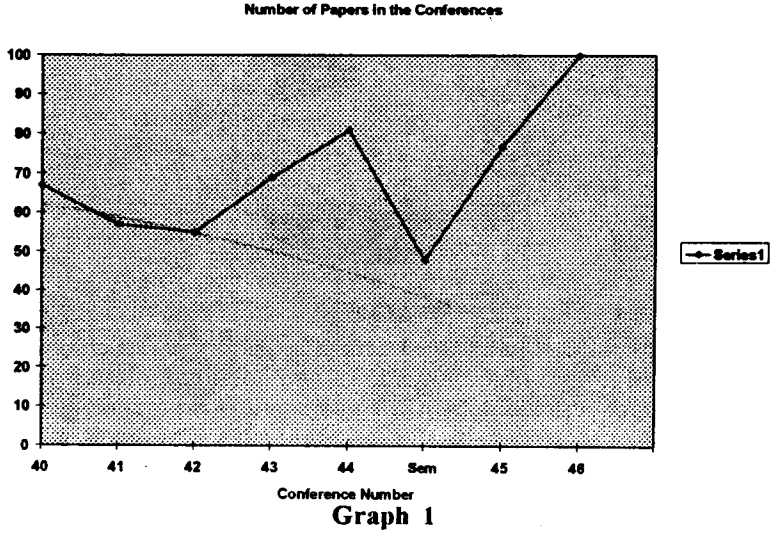
This part analyses papers contributed in these conferences and one seminar.

4.2 Number of Papers

In all 550 articles have been published in these volumes as shown in Table 1. The numbers are gradually rising which is very encouraging. Please see graph 1 also.

Table-1: Authorship Pattern : Number of Papers in a Conference

S.N	Authorship	40 Panji	41 Vij	42 Cali	43 Cha	44 Hy	Sem Vado	45 Hiss	46 Ahe	T	%
01	SingleAuthorship	46	35	43	37	46	28	42	54	331	60.18
02	Double -"-	17	15	06	22	24	17	27	41	169	30.72
03	Triple -"-	04	07	05	05	11	-	08	05	045	08.18
04	Four -"-	-	-	01	01	-	03	-		005	0.90
	Total Papers	67	57	55	69	81	48	77	100	550	100
	Total Authorship	92	86	74	100	127	74	120	151	824	



Graph 1

4.3 Types of authorship of papers

The table 1 also reveals the types of authorship of the papers contributed .In all 60.18% papers are of single authorship while

30.72% have been written jointly by two authors , Very few (9.08%) papers are written by 3 or 4 authors as shown in the above Table1 and Diagram below.

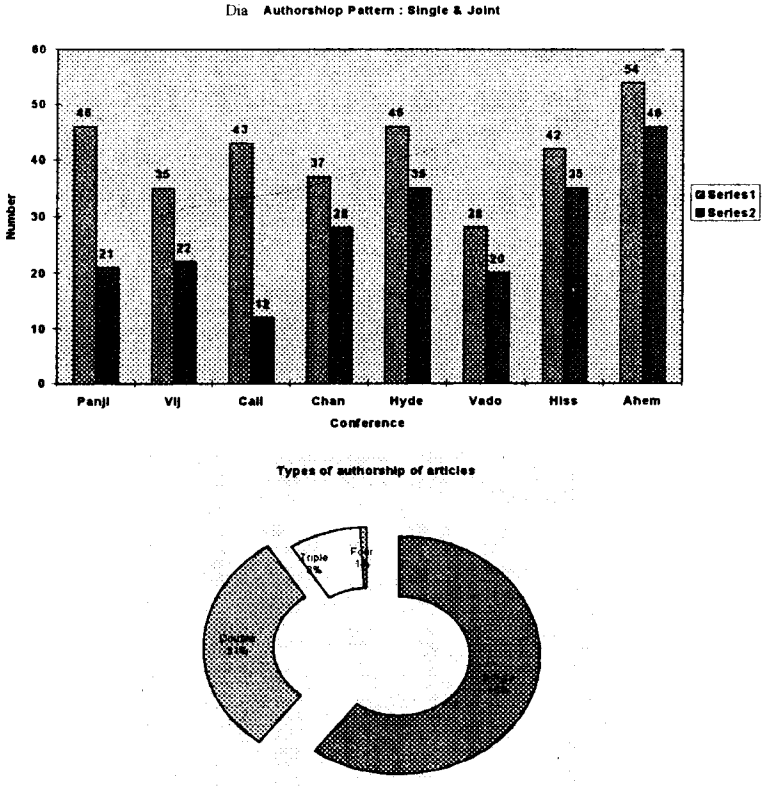


Diagram 1b

But one thing is to be noted here. The pattern is fast changing from 43rd conference onward. In the 46th conference joint authorship papers are 46% while at Panaji, this percentage was only 31%. So there is a rise towards joint authorship papers.

4.4 Length of Papers

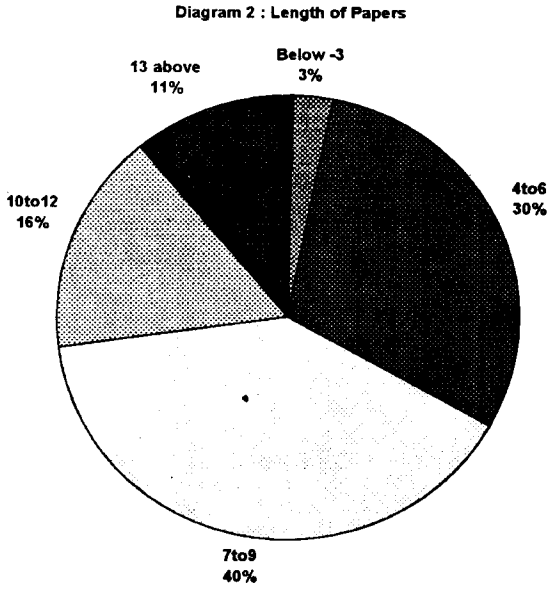
The average length of papers is 8.38 pages per paper of size 9 x 15 cm which is almost similar in all volumes. (Table 2 & D 2 & G 2) There are few papers of 1 page only. The lengthiest paper is of 45 pages (incidentally from one of the authors of this paper). Most

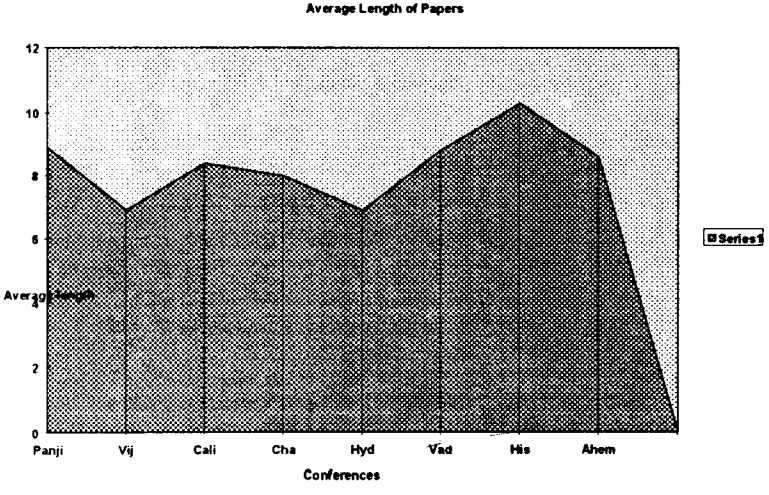
of the papers have 4 to 12 pages and 475 out of 550 (86.36%) papers are within this category. Pic-a diagram shows the number of papers in different categories.

Table-2 : Length of Papers

Number of Papers

S.N.	No. of Page	40 Panji	41 Vij	42 Cali	43 Cha	44 Hy	Sem Vado	45 Hiss	46 Ahe	T	%
01	01	-	04	-	-	-	-	-	-	04	00.72
02	02	-	03	-	-	01	-	-	-	04	00.72
03	03	01	01	-	-	02	01	-	04	08	01.44
04	04	05	04	04	04	04	05	03	04	33	06.00
05	05	11	12	04	06	20	05	03	07	68	12.36
06	06	12	03	09	08	10	05	07	12	66	12.00
07	07	04	07	09	18	19	04	13	16	90	16.36
08	07	06	07	05	09	09	04	10	14	65	11.81
09	09	10	03	07	09	04	06	12	12	63	11.45
10	10	02	05	03	03	04	05	07	05	34	06.18
11	11	03	03	06	01	03	03	03	08	30	05.45
12	12	04	-	03	03	01	03	05	07	26	04.72
13	13	03	01	01	02	-	01	02	02	12	02.18
14	14	01	01	01	-	02	03	03	04	15	02.72
15	15	01	01	02	-	-	-	05	02	11	02.00
16	16	-	01	-	-	01	01	01	-	04	00.72
17	17	01	-	-	01	-	01	01	-	04	00.72
18	18	-	01	01	01	01	01	-	01	06	01.09
19	19	-	-	-	-	-	-	-	02	02	00.36
20	20	01	-	-	-	-	-	-	-	01	00.18
21	28	02	-	-	-	-	-	01	-	03	00.54
22	45	-	-	-	-	-	-	01	-	01	00.18
Total	Papers	67	57	55	65	81	48	77	100	550	100
Total	Papers	597	396	462	519	560	472	795	883	4609	
Ave.	Papers	8.91	6.95	8.40	7.98	6.91	8.79	10.3	8.58	8.38	
Total	Page	597	396	462	519	560	422	795	838	4609	


Diagram 2 : Length of Papers
13 above
11%
Below -3
3%
4to6
30%
10to12
16%
7to9
40%


Average Length of Papers
12
10
8
6
4
2
0
Panji
Vij
Cali
Cha
Hyd
Vad
His
Ahem
Conferences
Series1

Graph 2

4.5. Number of Tables

Table 3 shows number of tables used in the papers. Only 26.18 % papers use tables ranging from 1-16 in number .

Table-3 : Number of Tables in the Papers

S.N.	Table	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahem	T	%
01	01	12	05	05	-	06	08	13	10	59	10.72
02	02	03	01	03	02	-	02	01	07	19	03.45
03	03	03	-	02	02	03	03	04	05	22	04.00
04	04	-	04	02	01	02	-	-	01	10	01.81
05	05	02	-	-	-	01	-	01	02	06	01.09
06	06	-	01	-	01	-	01	02	-	05	00.90
07	07	-	02	-	-	-	01	02	01	06	01.09
08	08	-	-	02	-	-	-	01	01	04	00.72
09	09	-	01	-	-	-	-	01	-	02	00.36
10	10	-	02	01	01	-	-	01	-	05	00.90
11	11	-	-	-	-	-	-	-	-	-	
12	12	-	01	-	-	-	-	01	-	02	00.36
13	13	-	-	-	-	-	01	01	-	02	00.36
14	14	-	-	-	-	-	-	-	-	-	-
15	15	-	-	-	-	-	-	-	-	-	-
16	16	01	-	-	-	-	-	01	-	02	00.36
Total	Tables	53	84	51	30	28	47	124	68	485	-
Article	With Ttables	21	17	15	07	12	16	29	27	144	26.18
Article	With Ttables	46	40	40	58	69	32	48	73	406	73.80
Grand	Total	67	57	55	65	81	48	77	100	550	100.0

4.6 Number of References

As shown in the Table 4, the average number of references per paper is 7.55 *i.e.* 8.00. But 94 (17.6%) papers do not have any references. The number of references ranges from 1 - 72 .Most of

the papers (47.50%) have 4-8 references. Only very few have 21 or above references . Types of documents cited in 550 papers having 4152 references can be studied as a separate study and research.

Table -4 : Number of References Per Papers

S.N.	Table	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahem	T	%
01	01	-	02	01	-	-	01	02	-	06	1.1
02	02	06	01	04	03	04	02	06	04	30	5.4
03	03	05	03	04	02	05	04	04	06	33	6.0
04	04	05	03	07	09	05	05	07	07	48	8.7
05	05	05	03	02	05	05	04	09	11	44	8.0
06	06	08	03	05	05	08	02	06	09	46	8.4
07	07	02	05	05	10	07	02	02	10	43	7.8
08	08	04	07	03	08	12	06	08	05	53	9.6
09	09	04	03	03	01	03	01	05	10	30	5.4
10	10	04	03	02	03	06	01	02	04	25	4.5
11	11	01	01	01	-	01	01	01	02	08	1.4
12	12	04	01	02	02	02	02	04	04	21	3.8
13	13	03	-	01	-	01	01	01	01	08	1.4
14	14	01	03	01	02	-	01	03	-	11	2.0
15	15	-	-	01	-	01	-	01	03	06	1.1
16	16-20	03	01	05	03	03	01	01	07	24	4.3
17	21-25	01	-	-	03	-	01	03	02	10	1.8
18	26-30	01	01	-	-	-	-	-	-	02	0.4
19	31-35	-	-	01	01	-	-	01	02	05	0.9
20	36-72	-	02	-	-	-	-	01	-	03	0.5
21	Nil	10	15	07	08	18	13	10	13	94	17.1
Total	Papers	67	57	55	65	81	48	77	100	550	100
Total	Ref.	504	411	364	481	769	252	602	769	4152	100
	Average	7.5	7.2	6.6	7.4	9.5	5.2	7.8	7.7	7.55	

4.7. Number of Diagrams and Graphs

Many a time diagram and graphs add to the quality of papers and form essential part of the papers especially when presented before audience. Use of diagrams in I L A conferences is not very encouraging . Only 78 papers have given 184 diagrams as shown in Table 5 . Use of graph in a paper is rare as shown in Table 6 .

Table-5 : Number of Diagrams

S.N.	No. of Page	40 Panji	41 Vij	42 Cali	43 Cha	44 Hy	Sem Vado	45 Hiss	46 Ahe	T	%
01	01	-	04	-	-	-	-	-	-	04	00.72
01	01	06	04	03	09	03	01	06	08	40	51.3
02	02	-	04	02	02	01	03	02	03	17	21.8
03	03	01	-	-	01	02	-	01	02	07	08.9
04	04	-	-	-	01	-	01	01	-	03	03.8
05	05	-	01	-	01	-	-	-	01	03	03.8
06	Above -05	04	-	-	02	-	-	02	-	08	10.3
Total	Diagrams	33	17	07	39	11	12	29	25	184	-
Total	Papers	11	09	05	16	06	05	12	14	78	100

Table-6 : Number of Diagrams

S.N.	Graphs	40 Panji	41 Vij	42 Cali	43 Cha	44 Hy	Sem Vado	45 Hiss	46 Ahe	T	%
01	01	-	-	02	-	-	03	-	02	07	78
02	02	-	-	-	01	-	-	-	-	02	22
Total	Graphs	-	-	02	02	-	03	-	02	09	100

5. AUTHORSHIP

As stated earlier. papers have been presented either by an individual —single authorship or of joint authorship. For 550 papers. 824 authorship have been counted. Here we should not confuse with total number of authors because many a times one author contributes more than one paper in one conference. The authorship constitutes all the papers written by "n" number of authors whether as single author or as joint authors To explain

in the 40th conference, there were 46 single author papers, 17 double author papers (34 authors) and 4 Triple author papers (12 authors). These 67 papers have been authored by 92 persons. On the other hand 6 authors have contributed 2 papers each.

The authorship pattern is studied in detail in Table 7 .It is divided according to Male/Female and their participation as single author or joint author. The papers have 24.03 % female and 75.97% male authorship. Single authorship constitute 40.17 % while 59.83 % are of joint authorship of two, three or four authors in a paper. Very few papers are of four authors, but papers of two authors have scored over single author papers.

Table -7 : Authorship Pattern : Number of Authors Contributing Papers

S.N.	Conference		Single	Double	Triple	Four	Total	%
01	40th Goa	M	30	30	09	-	69	08.37
		F	16	04	03	-	23	02.79
		T	46	34	12	-	92	11.16
		%	05..58	04.12	01.46	-	11.16	
02	41st Vijawada	M	17	22	20	-	59	07.16
		F	18	08	01	-	27	03.27
		T	35	30	21	-	86	10.43
		%	04.24	03.64.	02.54	-	10.43	
03	42nd Calicut	M	29	08	12	04	53	06.43
		F	14	04	03	-	21	02.54
		T	43	12	15	04	74	08.98
		%	08.22	01.45	01.82	00.48	08.98	
04	43rd	M	23	34	10	03	70	08.49
	Chandigarh	F	14	10	05	01	30	03.64
		T	37	44	15	04	100	12..13
		%	04.49	05.33	01.82	00.48	12.13	
05	44th	M	36	38	31	-	105	12.74
	Hyderabad	F	10	10	02	-	22	02.67
		T	46	48	33	-	127	15.41
		%	05.58	05.82	04.00	-	15.41	

06	Vadodra	M	22	26	-	12	60	07.28
		F	06	08	-	-	14	01.69
		T	28	34	-	12	74	08.98
		%	03.40	04.12	-	1.45	08.98	
07	45th Hissar	M	30	40	21	-	91	11.04
		F	12	14	03	-	29	03.51
		T	42	54	24	-	120	14.56
		%	5.09	06.55	02.91	-	14.56	
08	46th	M	40	68	11	-	119	14.44
	Ahemdabad	F	14	14	04	-	32	03.88
		T	54	82	15	-	151	18.32
		%	6.55	09.95	01.82	-	18.32	
09	Grant Total	M	227	266	114	19	626	75.97
		F	104	72	21	1	198	24.03
		T	331	338	135	20	824	100
		%	40.17	41.02	16.38	02.43	100	

6. NUMBER OF PAPERS BY ONE AUTHOR IN A CONFERENCE

Usually one author may contribute one or more paper in a conference either as single author or as joint author. This has been studied in Table 7. Out of these, 62 authors have contributed 2 papers in a conference (T 124 papers) and 7 authors have contributed 3 papers in a conference (T 21 papers). All other authors have contributed only one paper in any one conference. T 9 and T 10 are detailed study of T 8 studying male/female contribution for 2 and 3 articles in a conference. In single authorship of these 80.64% are males and only 19.35% are females. Only 17.23 % papers are of single authorship and other 82.27 % are of joint authorship of 2 or 3 or 4 authors. The male/female break up is also available in this table.

Table-8 :Number of Authors Contributing Papers in an I L A Conference

S.N	Articals	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahe	T	Auth-ors
01	1 Article	080	075	061	084	106	056	086	131	679	679
02	2 Articles	006	004	005	008	006	009	014	010	062	124

03	3 Articles	-	001	001	-	003	-	002	-	007	021
Total Papers n		092	086	074	100	127	074	120	151		824

Table-9 :Two Papers in a Conference: Authorship Pattern

S.N.	Categories	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahe	T	%
01	Male										
Single	Authorship	03	01	-	03	04	05	04	01	21	16.93
Double	Authorship	05	01	02	07	03	03	10	13	44	35.48
Triple	Authorship	02	04	04	03	03	-	10	-	26	20.96
Four	Authorship	-	-	-	01	-	08	-	-	09	05.64
	Total	10	06	06	14	10	16	24	14	96	80.65
02	Female										
Single	Authorship	01	-	-	-	-	-	-	-	01	00.80
Double	Authorship	-	02	02	02	-	02	02	05	15	12.09
Triple	Authorship	01	-	02	-	02	-	02	01	08	06.45
Four	Authorship	-	-	-	-	-	-	-	-	-	-
	Total	02	02	04	02	02	02	04	06	24	19.35
03	Grand Total										
Single	Authorship	04	01	-	03	04	05	04	01	22	17.14
Double	Authorship	05	03	04	09	03	05	12	18	59	47.58
Triple	Authorship	03	04	06	03	05	-	12	01	34	27.41
Four	Authorship	-	-	-	01	-	08	-	-	09	07.05
	Total	12	08	10	16	12	14	28	20	124	100.0

Table-10 : Three Papers in a Conference : Authorship Pattern

S.N.	Categories	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahe	T	%
01	Male										
Single	Authorship	-	-	-	-	01	-	01	-	02	09.52
Double	Authorship	-	02	-	-	03	-	04	-	09	42.85
Triple	Authorship	-	01	-	-	05	-	01	-	07	33.33

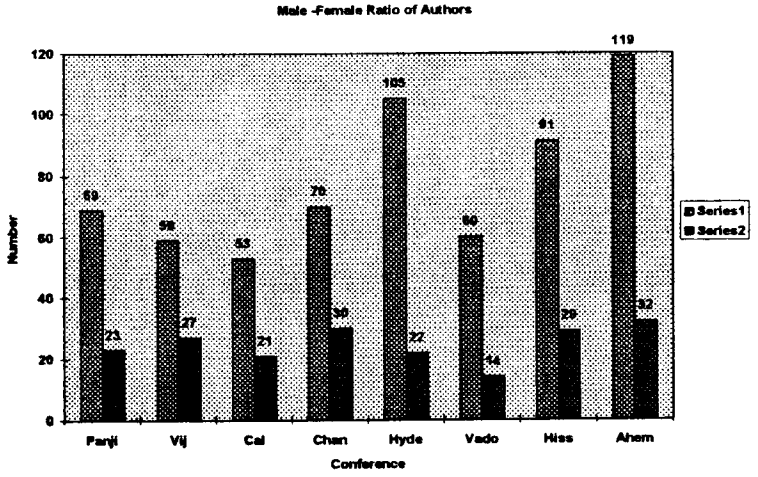
Four	Authorship	-	-	-	-	-	-	-	-		-
	Total	-	03	-	-	09	-	06		18	85.71
02	Female										
Single	Authorship	-	-	03	-	-	-	-	-	03	14.28
Double	Authorship	-	-	-	-	-	-	-	-		
Triple	Authorship	-	-	-	-	-	-	-	-		
Four	Authorship	-	-	-	-	-	-	-	-		
	Total	-	-	03	-	-	-	-	-	03	14.28
03	Grand Total										
Single	Authorship	-	-	03	-	01	-	01	-	05	23.81
Double	Authorship	-	02	-	-	03	-	04	-	09	42.85
Triple	Authorship	-	01	-	-	05	-	01	-	07	33.33
Four	Authorship	-	-	-	-	-	-	-	-	-	
	Total	-	03	03	-	09	-	06	-	21	100

7. FEMALE CONTRIBUTORS

Female participation is 24.03% as compared to 75.97% male participation as shown in T 7 given earlier. Out of total 198 female authorships 104 (52.52 %) are of single authorship while 72 (36.36 %) are joint authorship, 21 (10.6%) with three authors of two authors and only one paper has four authors as shown in Table11. If we compare this with male participation, it is very low. On detailed examination of table 7 we can find that out of total 626 male authorships 227 are of single authorships while 266 are of double authorship and 114 have three authors and 19 have four authors. The Graph 3 shows male-female ratio in these conferences.

Table-11 : Female Authorship in I L A Conferences

S.N.	Authorship	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahe	T	%
01	Single Authorship	16	18	14	14	10	06	12	14	104	52.52
02	Double	04	08	04	10	10	08	14	14	072	36.36
03	Triple	03	01	03	05	02	-	03	04	021	10.06
	Four Authorship	-	-	-	01	-	-	-	-	001	00.50
	Total	23	27	21	30	22	14	29	32	198	24.03
	Total Authorship	92	86	74	100	127	74	120	151	824	100



Graph 3

8. STATEWISE DISTRIBUTION OF AUTHORSHIP

Table 12 shows statewise distribution of total authorship in rank order. The Table excludes authors who have contributed more than one article in one single conference but includes his contributions in different conferences for statistical convenience. Karnataka is at the top with 112 authorships (13.59%) followed by Andhra Pradesh and Delhi. Surprisingly very little contributions from by states like Rajasthan, Gujarat, Orissa, Bihar can be seen from this Table. Contributions from a very big state Uttar Pradesh (including Uttranchal) is also satisfactoy below level.

Table-12 : Statewise Distribution of Authorship : Rank Order

Rank	State	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahe	T	%
01	Karnataka	13	12	11	21	22	03	12	18	112	13.59
02	Andhra Pradesh	12	14	08	06	25	12	09	17	103	12.50
03	Delhi	17	07	03	08	16	20	13	23	107	12.98
04	Tamil Nadu	09	13	13	05	14	04	08	09	75	09.10
05	Maharashtra	03	04	06	13	06	07	02	11	52	06.31
06	M. P.	03	03	-	05	03	06	09	08	37	04.49

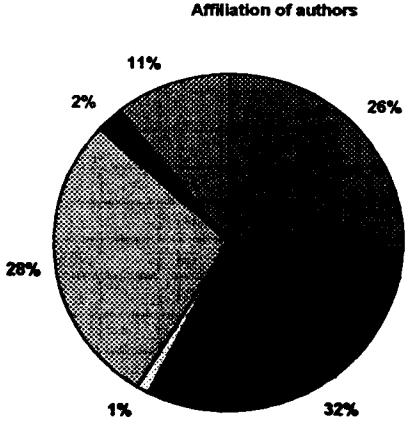
07	West Bengal	07	03	04	03	01	01	05	11	35	04.24
08	Punjab	07	02	-	03	03	03	06	09	33	04.00
09	Chandigarh	-	-	01	14	03	02	10	01	31	03.76
10	UP+UA	04	03	02	01	06	03	04	08	31	03.76
11	Hariyana	-	03	03	06	04	01	06	06	29	03.52
12	Kerala	02	03	04	03	05	-	05	01	23	02.79
13	Orisa	-	03	05	01	03	-	03	04	19	02.30
14	Gujarat	-	02	-	-	01	03	04	07	17	02.06
15	J&K	02	02	02	01	-	-	04	06	17	02.06
16	Rajasthan	-	-	05	-	01	05	04	01	16	01.94
17	Assam	04	04	-	-	02	-	02	-	12	01.45
18	Bihar	02	01	-	-	-	-	-	01	04	00.48
19	Sikkim	-	02	01	01	-	-	-	-	04	00.48
20	Pandichery	-	01	01	-	-	01	-	-	03	00.36
21	Goa	-	-	-	-	-	-	-	01	01	00.12
22	Manipur	01	-	-	-	-	-	-	-	01	00.12
23	N.A.	06	04	05	09	12	03	14	09	62	07.52
	Grand Total	92	86	74	100	127	74	120	151	824	100
	%	11.16	10.43	08.98	12.83	15.41	08.98	14.56	18.32	100	

9. AFFILIATION OF AUTHORS

Table 13 shows affiliation of authors to various institutes. 25.97% are from the teaching faculty though their number is less in India. Majority of librarians are in the Academic and Special libraries which have 31.55% and 29.85 % authorship pattern respectively. Out of Academic librarians only 06 authorship belong to school libraries which is too less. Contributors from public libraries are also far below expectation. Public Library Acts have been enacted in 11 states and a public library systems is working in many states but only 8 papers from the authors working in public libraries are available. This is really very apathetic. A few non-library science professionals have also contributed. They are mainly from I T and management sectors.

Table-13 : Affiliation of Authorship : Number of Papers

Rank	State	40 Panji	41 Vij	42 Cali	43 Cha	44 Hyd.	Sem Vado	45 Hiss	46 Ahe	T	%
01	Teaching										
	Professor	03	03	02	04	07	-	07	06	32	
	Reader	05	03	08	03	12	05	07	11	54	
	Lecturer	14	12	05	16	14	07	10	12	90	
	Research Scholars	-	04	01	05	12	-	01	03	26	
	Retired	01	-	-	-	01	01	01	01	05	
	HOD	-	-	-	-	-	02	-	05	07	
	Total	23	22	16	28	46	15	26	38	214	25.97
02	Acad. Libraries										
	University Libn.	04	04	03	02	01	04	05	01	24	
	Deputy Librarian	04	04	02	06	04	03	04	03	30	
	Asst.Libr./Others	13	06	14	20	21	08	03	45	130	
	No Designation	04	-	-	03	-	-	-	07	14	
	College Librarian	09	12	05	03	07	07	10	03	56	
	School Librarian	01	-	01	01	01	-	01	01	06	
	Total	35	26	25	35	34	22	23	60	260	
03	Public Librarian	-	02	01	01	01	01	-	02	08	00.96
04	Specia/ Lib.										
	Librarian	03	-	20	25	36	06	19	13	122	
	Scientist	07	04	-	-	-	06	19	10	46	
	Asst Libr Doc Offi	04	08	-	-	-	09	17	13	51	
	Computer	-	01	-	-	-	-	-	01	02	
	No Designation	-	05	-	-	-	04	-	03	12	
	Total	14	18	20	25	36	25	55	40	233	28.22
05	Others	-	02	03	04	02	02	04	02	19	02.31
06	No Designation	06	06	07	07	08	-	-	09	43	05.22
07	TMA	14	10	02	-	-	09	12	-	47	05.70
	Total	92	86	74	100	127	74	120	151	824	100



9. RANK ORDER OF THE AUTHORS

This is an important study of this paper. Rank orders have been calculated in two ways ,first on the basis of total number of papers and second on the basis of scores obtained with formula . It made big difference as shown in the Table 14 .

Table -14 : Rank Order of Authors: Number of Papers and Scores of Authors

S.N.	Authors	@+ 1.00	+= 0.50	*= 0.33	#= 0.25	T	Rank	Score	Rank 2
01	Kannapanawar, B U	02	06	03	01	12	01	6.24	02
02	Maheshvarrappa, B S	-	05	05	-	10	02	4.15	07
03	Tadasad, P G	-	05	05	-	10	02	4.15	07
04	Venktaramana,V	-	04	04	02	10	02	3.80	-
05	Ramesh Babu,B	02	03	04	-	09	03	4.83	05
06	Chopra, H S	08	-	-	-	08	04	8.00	01
07	Sangam ,S L	01	06	01	-	08	04	4.33	06
08	Kumar ,S	-	08	-	-	08	04	4.00	06
09	Vartha Rajan, N	-	04	02	02	08	04	3.16	-
10	Dabas, K C	01	04	03	-	08	04	4.00	08
11	Manorama Shrinath	01	05	01	-	07	05	3.83	09
12	Shah, Leena	-	07	-	-	07	05	3.50	10
13	More, Sarswati	06	-	-	-	06	07	6.00	03

14	Harish Chandra	04	01	01	-	06	06	4.83	05
15	Sonal Singh	02	04	-	-	06	06	4.00	08
16	Basu, Keya	06	-	-	-	06	06	6.00	03
17	Ramman Nair	05	-	-	-	05	07	5.00	04
18	Baba, Abdul Majid	05	-	-	-	05	07	5.00	04
19	Pharande, C P	04	-	01	-	05	07	4.33	06
20	Sukhadev Singh	04	-	01	-	05	07	4.33	06
21	Dhawan , S M	03	01	01	-	05	07	3.83	09
22	Raina, Roshan	03	01	01	-	05	07	3.83	09
23.	Gill , N S	-	02	03	-	05	07	2.00	-
24	Bhatt , R K	01	03	01	-	05	07	1.83	-
25.	Bhurauddin , Moh.	-	-	03	02	05	07	1.24	-
26.	Surendra Singh	-	05	-	-	05	07	2.5	-
27.	Baradol, A K	04	-	-	-	04	08	4.00	08
28.	Siwatch , Ajit S	04	-	-	-	04	08	4.00	08
29.	Saknure , B G	04	-	-	-	04	08	4.00	08
30.	Somam, Ali	04	-	-	-	04	08	4.00	08
31.	Gupta, Sangeeta	03	-	01	-	04	08	3.50	-
32.	Sewa Singh	02	02	-	-	04	08	3.00	-
33.	Nithyanandam,K	02	02	-	-	04	08	3.00	-
34.	Nandwana, H B	02	02	-	-	04	08	3.00	-
35.	Kaliyaperumal, K	-	02	02	-	04	08	1.66	-
36.	Ramesh, D B	-	-	03	01	04	08	1.24	-
37.	Sahu, J R	-	-	03	01	04	08	1.24	-
38.	Vijaya Laxmii, N	-	-	04	-	04	08	1.32	-
39.	Bandopadhyay , A	04	-	-	-	04	08	4.0	08
40.	Dabbas, Sheela	-	1	3	-	04	08	1.50	-
41.	Sasikala, C	02	-	-	-	04	08	2.83	-
42.	Somshekhar Rao, K	04	-	-	-	04	08	4.0	08
43.	Vijay Kumar	-	1	2	1	04	08	1.41	

9.1. Rank order according to number of papers

This rank order has been prepared on the basis of simple calculation of number of papers contributed in these conferences

without considering whether it is written as single authorship or as joint authorship.The study is based on a cummulative index of authors.

The table 14 shows Dr. B. U. Kannapanwar at the top with 12 papers followed by B. S. Maheswarappa ,P. G. Tadasadand V. Venkataramanna contributing 10 papers each. Dr. Ramesh Babu is on 3rd position with 9 papers. 4th rank is occupied by 5 authors, S Kumar, N .Vertharajan,. K .C. Dabbas,H .S. Chopra, S. L. Sangam. 5th rank is occupied by 2 authors Leena Shah and Manorama Srinath with 7 papers each. 6th rank is occupied by 4 authors with 6 papers each and 7th place is shared by 10 authors and 8th position by 17 authors.

10. RANK ORDER ACCORDING TO SCORES

To calculate scores of individual authors and find out rank order , a cummulative index of authors have been prepared along with code for conference, article number and pages. It also bears signs for single authorship @, two authorship + , three authorship * and four authorship # for calculation purpose. Women authors have sign $. and is used for more than one article in one conference. Cummulative score has been provided for each author in these eight conferences from 40 to 46 and Vadodra Seminar.

Bibliomertricians differ on scoring procedures. Many give weightage to first author giving more score (say 0.65) to Ist author and less score to second author (say 0.35)and so on. But studies reveals that this system is not always satisfactory. For many reasons, Ist author is not always responsible for more thought contents.. I L A has made a rule that copy of volume will be given only to Ist author . Often it may happen that Ist author may not be in a position to attend the conferences and in such cases author contributing less may be placed as Ist author. Besides there are many other reasons for which they are placed as first author though their contribution may be less or even nil. Sometimes a junior may please his senior colleague by placing him/ her as Ist author , etc. For these reasons in the Indian context, we have formulated a new principle. We have provided scores as follows..

Maximum score 1.00

@ For single authorship paper score 1.00 for only author

\+ For double authorship paper score 0.50 for each author

* For triple authorship paper score 0.33 for each author

\# For four authorship paper score 0.25 for each author

This we can understand with an example . If one author has contributed 8 papers in these conferences, the scores have been calculated as below .

Single authorship	papers	2 x1	score 2.00
Double authorship	papers	1x0.50	score 0.50
Triple authorship	papers	3 x0.33	score 0.99
Four authorship	papers	2 x0.25	score 0.50
Total score of 8	papers		3.99

As stated a cummulative list of authors have been prepared and on the basis of the number of papers and type of authorship of an author in all the 8 volumes, scores for individual authors have been given.

In all these conferences authors have been listed in the cumulative index who have either contributed at least one paoer in a conference either as an individual or in collaboration with 2, or 3 or 4 authors. Thus each one got atleast 025 scores as minimum. The variation of scores in the table depend upon number of papers and type of authorship. The heighest score is 8 for one author .

If we observe this table, majority have scored 0..33,0.50 and 1.00 scores by 51 (11.1%), 125 (27.2%) and 152 (33.1%) respectively.

It is also revealed that 286 authors (62.3%) have contributed only one paper in any one of the above conferences. Similarly 87 (18.9%) have contributed two articles and 34 (7.4 %) 3 papers in any one of these conferences. Authors contributing 4 more papers are just 43 (9.3%) and are listed in a separate table along with their scores.

On the basis of authorship style as stated earlier and with the help of cummulative author index, rank order of scores are also given in the same table 14. On minute examination of this table we see that now the Ist rank has changed. Dr. H S Chopra tops the list with score 8.00 for his 8 papers. Dr. Kannapanwar shifts to IInd rank with score 6.24 for his 12 papers. Miss Saraswati More occupies IIIrd rank with 6.00 score for her six articles and Keya Basu shares this rank with 6 score for her 6 papers .

4th place is occupied by Raman Nair and Abdual Mazid Baba

for their 5 papers. With 5 score each.5th place is shared by B Ramesh Babu for 9 papers and Harish Chandra for 6 papers scoring 4.83 score each.6th place is shared by S L Sangam,C Pharande and Sukhbeer Singh .Maheshwarappa and Tadasad occupy 7th rank with 4.15 scores for their 10 papers each . There are many authors who have scored 4 points on 8th rank.

Thus we see that ranks according to scores obtained is more scientific then on the basis of total number of papers. .

Table-15. Rank Order According to Score

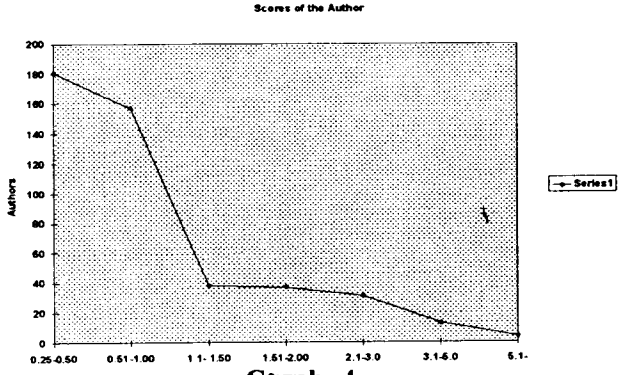
Rank 2	Name	Papers	Score	(Earlier)Rank 1
1.	Chopra, H S	08	8.00	4
2.	Kannaparwar, B U	12	6.24	1
3.	Sarswati More	6	6	6.00
	Basu, Keya	6	6.00	6
4.	Raman Nair	5.	5.00	5
	Abdul Maszid Baba	5	5.00	7
5.	Ramesh Babu	9	4.83	3
	Harish Chandra	6	4.83	6
6.	Sangam, SL	8	4.33	6
	Pharande	5	4.33	7
	Sukhedev Singh	5	4.33	7
7.	Maheshrappa, BS	10	4.15	2
	Tadas, PG	10	4.15	2
8.	Kumar S	8	4.00	4
	Dabas , K C	8	4.00	4
	Sonal Singh	6	4.00	6
	Baradol	4	4.00	8
	Siwatch	4	4.00	8
	Saknur	4	4.00	8
	Somum	4	4.00	8
	Bandopadhya	4	4.00	8
	Simsha Rao	4	4.00	8

Scores of all the 459 authors are given in table 16 and graph 4.

Table-16 : Scores of Authors : Rank Order n = 459

Rank	Score	No. of Authors	Rank	Score	No. of Authors
01	8.00	01	15	2.83	002
02	6.24	01	16	2.25	003
03	6.00	02	17	2.00	035
04	5.00	02	18	1.97	001
05	4.83	02	19	1.66	001
06	4.33	03	20	1.50	021
07	4.15	06	21	1.33	011
08	4.00	05	22	1.25	006
09	3.97	01	23	1.00	149
10	3.83	04	24	0.91	001
11	3.82	01	25	0.83	005
12	3.50	02	26	0.50	122
13	3.10	01	27	0.33	050
14	3.00	16	28	0.25	005

Score each author per articles : Single Authorship 1.00 Two Aythors 0.50 Three Authors 0 .33. Four Authors 0.25



Graph 4

Besides other 34 (7.4%) authors have contributed 3 papers, 87 (18.9%) authors have contributed 2 articles and 295 (64.3%) authors have contributed only one paper in these I L A conferences. Their rank and scores can be calculated on similar patterns by the authors themselves as has been calculated for 43

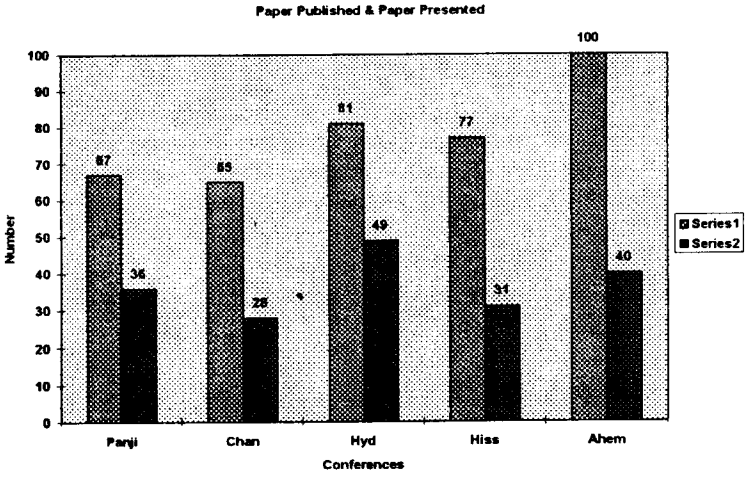
authors. .

11. PAPER PRESENTED AND PUBLISHED

On an average 47 % of the papers published are presented during the conference. At Hissar and Ahemdabad the percentage was as low as 40 % while at Panaji it was 53.74 % and at Hyedrabad it was 60.5 %. The information for conferences at Vijaywada , Calicut and Vadodra are incomplete in the proceedings so they have not been considered here. The proceeding should contain this information specifically and steps must be taken to increase this number.The Table 17 and Graph 5 shows the figure for papers presented

Table-17 : Paper Published and Papers Presented by the Authors

S.N	Conference No	In Volume	Paper Presented	%	Extra Paper Presented
01	40 Panaji	67	36	53.74	06
02	41 Vijyawada	57*	NA	NA	11
03	42 Calicut	55*	NA	NA	-
04	43 Chandigarh	65	28	43.07	02
05	44 Hyderabad	81	49	60.49	01
06	Sem. Vadodra	48*	NA	NA	01
07	45 Hissar	77	31	40.26	
08	46 Ahmedabad	100	40	40.0	
	Grand Total	550	184	47.18	21



Data for Paper presented in conference number 41, 42 & Sem, not availabie

Graph 5

12. BEST PAPER AWARD

The "Best Paper Award" is given after each conference during the concluding session. The award is for best written and presented paper . Often some good written paper can not be considered, if it has not been presented At Ahmedabad in the 46th conference Award of Commendation were also given to 5 papers in 10 different sessions for writing and presentation . A list of these papers has been given in Table 18. Information for 43rd conference is not available and such award was not given in the seminar held at Vadodra .

Table-18: List of "Best Paper Award" and " Awards of Commendation"

S.N.	C.N	Title of Papers	Pages	Ref., etc.	Authors	T.P.	Scores
01.	40	Self- image of Lib & Inf. Professional	515-31	R 2 T-24	Samyuktha, R Raghavan ,KS	3 2	1.5 1
02.	41	Treatment of users	182-88	R 10	Rajaram ,Shyama	1	1
03	42	Inf.Dissemination.	329-35	R 06	Sharma Chandra B	1	1
04	43	NA	NA	NA	NA	NA	NA
05	44	Inf. Res. Development in	411-16	R 05	Accanoor, Kalyani Kularni, Shobha	2 2	1 1
06	Sem	Not given	-	-	-	-	-
07	45	Application of I T in. Academic Lib. & Inf. Centres in Channai	358-65	T 07	Kasi Rao, V Ramesh Babu , B Kaliyaperumal. K	1 9 4	0.33 4.83 1.66
08	46 BP	Ensuring Q M. in marketiug and Adv. Lib.	750-60	R 06 T 01	Venkata Kesvar, R Hagnik, Shalesh	3 1	1.50 0.50
	AC	Q Inf M for end User satisfaction	66-75	R 18	Jagtr Singh Trishan jit Kaur	2	1.50
	2	Professional insight into TQM in Lib. Service	228-37	R09	Saksena, Manish	3	3
	3	Book availability as a performance measure in	295-306	R 20 T 02	Urs, Shalni R Dominic, J	1 1	0.50 0.50
	4	Future of LIS-App I.T QIP Test-Lib. personnel	423.36 548-56	R-17 -	Kundu, Sharbani R Dutta, Jain	1 1	1 1
	5	Research in LIS An analysis for future change	785-803	R 15 T-07	Kumar, S Shah, Leena	8 7	4.00 3..50

R- References, D- Diagrams, T-Tables, T P-Total Papers contributed in these conferences B P - Best Paper A C - Award of Commendation

On close analysis of these papers we find that in case of 3 authors it was only one paper. On the other hand 9 papers by one author. Two best papers are single author paper and three are double authors papers. One best paper is written by three authors. Only 3 papers have few tables. Number of references vary from 0-7. Out of 11 authors 4 are females. Many awardees later did not contribute any paper.

The papers which received "Award of Commendation" have also been analysed. These 5 papers have been written by 11 authors. 2 of the papers are written individually while 3 are joint author papers. For 6 authors it was their Ist paper in last 8 conferences and seminars . In case of few authors it was their 7th or 8th paper during this period .

The Best Paper Awards can be given "3 Bonus Marks" and Award of Commendation papers can be given "2 Bonus Marks" in their scores. These marks will be divisible equally into joint authors .The rank order table may be amended accordingly . Only 3 authors from this list are available in the rank order table .

13. CONCLUSION

For the calculation of best among best authorship more parameters can be taken into consideration. The weightage may be given for awards during the I L A conferences . Scores may be added suitably for length of papers, number of references, number of tables, diagrams and graphs ,etc. But all this will make the work more and more difficult These scores may be very helpful in evaluating a professional for assessments and helpful in human resource development .

14. SUGGESTIONS

Following suggestions are made on the basis of this study.

1. Looking to the trends of joint authorship and collaborate research , I L A should take steps for more quality papers.
2. Authors from public libraries and school libraries may be encouraged by organising seminars exclusively for them.
3. Authors from inter-disciplinary fields may be associated to contribute quality papers .
4. Size of the volume may be increased to make it more handy . It may be a multi -volume publication also.
5. Floppy of papers may be distributed along with the volume.
6. Pre-conference papers may be made available online.
7. I L A should provide copy of volume to any one of the authors present.
8. Steps may be taken to encourage compulsory deliberation of papers from the authors. Practice of presenting a paper by

others should be discouraged such a practice is not conclusive to discussion .

9. For the presentation of papers, sufficient time should be given
10. Parallel sessions can be arranged for better discussion on the papers.
11 Studies based or scores can be conducted for I L A bulletin as part of further research.
12 The authors of 10-15 written papers considered for the best paper award adjudged at the time of publication of the volume may be informed for presentation during the conference .
13.. " Youngest Participants Award" and Young Librarian Award for best written paper and presentation awards may be instituted. Similarly Women Librarian Award for best written paper and presentation may also be considered.
14. Best Written Paper should also be awarded because many good papers can not be awarded for absence of author or due to shortage of time ,etc..
15. Theme of the papers and place of the conference may be declared of the closing ceremony of earlier conference to facilitate authors for quality work .

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31

Quality Audit and Action Plans for Implementation TQM in University Libraries

K.C.DABAS*
SEWA SINGH**

ABSTRACT

The paper briefly reports the result of a study undertaken to assess the application of Total Management (TQM) in nine university libraries in Haryana, Chandigarh and Punjab. The study reveals that quality of people working in libraries combined with participative and non-authoritarian style of functioning are more important for the implementation of TQM. Major tools and techniques of TQM such as benchmarking, organisational learning and reengineering may help the libraries.

A study undertaken recently explored the application of TQM in nine university libraries in Punjab, Haryana and Chandigarh and defined TQM as a philosophy and big umbrella. Every activity that the libraries have done or will do fit under this umbrella. It is a complete way of managing libraries with focus on customer, process, staff and quality.

Libraries studied in the project included Guru Nanak Dev University Library, Amritsar (GNDL); Maharshi Dayanand University Library, Rohtak (MDUL); Punjab Agricultural University Library, Ludhiana (PAUL); Haryana Agricultural University Library Hisar (HAUL); Punjabi University Library, Patiala (PULP); Kurukshetra University Library, Kurukshetra (KULK); Thapar Institute of Engineering and Technology Library, Patiala (TIETL); Guru Jambheswar University Library,

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Hisar (GJUL) and Panjab University Library, Chandigarh (PULC).

1.INTRODUCTION

Quality is meeting customer requirement, desires, and expectations. It is what the customer says, perceives and believes. Every single task in the library is viewed as a process and library users judge not only collection, staff, facilities and services but also the mode of delivering the service.

Data and information is a vehicle to achieve, control, monitor and improve quality at all stages. The Plan-Do-Check-Act (PDCA) cycle of Deming with Fourteen Principles is sufficient to manage quality in the libraries.

2.THE STUDY

The study examines the existence of various principles, processes and factors reported as most crucial for TQM application in review of literature. These include customer focus, employees involvement, process improvement, management leadership, team work, orgainisational structure, work culture, purpose, conceptual clarity about the contents and goals of TQM, awareness of activities, action plans, adaptation of existing practices, codification, designing, redesigning, reengineering, benchmarking and organisational learning in libraries.

The study has looked at the application of total quality management that consisted of a number of elements, For example, when activities related to awareness of one element were being undertaken, activities related to understanding for another element of TQM were also going on at the same time. Ilence, there may have been a sequence in the implementation of individual elements, but at the level of TQM, there was no particular sequence discernible. The data reported in the study also supported this view. For example, quality policy, work culture, reward and recognition system, education and training, pride of workmanship and leadership styles are most important factors for the involvement and commitment of the staff

In HAUL, quality policy, education and training, reward and recognition system, work culture, and pride of workmanship level is highest amongst all universities due to compatible organisational culture created by task oriented, nurturant and participative leadership styles. In MDUL and GNDUL the level

of quality policy, education and training, work culture, reward and recognition system is lowest due to incompatible culture created by authoritarian leadership style.

The results of the study show that excellent information services of the libraries and fee-based services are closely-associated with quality management. For example PULC charges for E-mail service and has also offered membership to corporale sector. These charges stimulate customer orientation, process improvement and enable users better services.

3.TESTING OF HYPOTRESES

The users of all the libraries gave maximum importance to reliability factor of library services, followed by willingness, assurance, empathy and tangibles. Regarding quality management, the study found that non-authoritative styles of leadership along with commitment and burning desire for quality are important factors of quality management.

A recent study emphasised the need for a regional library network for sharing of the resources of the university libraries in the states of Punjdb, Haryana, Himachal Pradesh and Union territory Chandigarh. This network may be called as Punjab, Haryana, Himachal Pradesh and Chandigarh library network (PHHCLIBNET). This network will be a natural learning resource sharing centre because the historical, cultural and geographical roots of all the university and college libraries go back to Panjab University Library, Chandigarh, which has already been recognised by INFLIBNET as one of the six major zonal nodes of INFLIBNET. For this network all the libraries should have standardised databases because non-standardised databases have no value. There is also a need for standardised information infrastructure for information resource management in the libraries.

The employees in all the nine university libraries possess more capability, creative talents, initiatives and resourcefulness than their job required them to use. Existing leadership styles failed to use that optimally. Leadership has to expect nothing but best from people by presenting themselves as the models of the behaviour they expect from the subordinates.

The Deputy and Assistant Librarians need to be involved in the application of TQM. They may be given some credit in the form of appreciation and recognition letters for the implementation of TQM related activities, to sustain their interest in the application of TQM. Since TQM is a people centered approach and self-development is the essence of TQM. Career advancement opportunitics, Human Resource Development activities, egalitarian practices in the distribution of organisatiunal rewards and facilities and improvement of interaction between staff and supervisors can be more effective. Sufficient resources need to be provided for the implementation and the employees need to be trained for creating awareness and conceptualisation of TQM concepts.

In the recent years some cases of managerial experiences of implementing IS-9001, 9002 and TQM in indian libraries have been reported. All these cases emphasise the need of well-defined quality policy, design and development of systems and procedure manual. This is manual aimed to make the system more transparent, dynamic, responsive, and representative of adopted quality policy. This manual also serve as a main source of information for staff, end-users, management, quality audit team to understand the services offered, staff responsibility, forms used, system and procedure followed. Based on the review of these cases it can be concluded that the implementation of TQM has not been reported comprchnsively. Focus is more on what was done and what were the achievements. How and why particular activities were taken up does not find a mention in the literature. Specific activities during implementation, factors facilitating implementation, sources of resistance and ways to overcome the resistance are some of the issues, which have not been addressed.

After commitment the second stage is to develop a vision of as to where they would reach in terms of services, performance, etc. in one, two, five, ten, twenty or even fifty years' time. Out of nine libraries only Panjab University Library, Chandigarh and Punjab Agricultural University, Ludhiana have written vision statements to provide internal and global information simultaneously as a unified transaction within next five to eight years. This vision statement does imply and convey an optimistic view that librarians and information managers have something of value to offer to its customers in the longer term. This clear

picture and shared sense of vision by all those involved in TQM implementation will equip the staff with sense of purpose, confidence, determination and committed efforts which will produce results. The other university libraries ought to develop their own written statements.

The third important stage for TQM is empowerment of all employees with knowledge, skills, dignity and attitude which ensure the implementation of all actions. There is a dire need to create teams, which use diverse talents to tackle real and practical problems and come with implementable solutions. It is natural that staff with most enthusiasm for quality improvement will lead and comprise these teams. At the initial stage, leaders of the teams will have to act with patience and tact.

Prompt, speedy and responsive services are essential prerequisites for TQM. S.R. Ranganathan's Fourth Law, "Save the time of the reader" has similar implications as advocated in TQM approach. Moreover the defiition of the term 'Documentation' as pinpointed, exhaustive and expeditious organisation and retrieval of information is the sum and substance of TQM approach. After commitment, clear vision, definition of quality in terms of library and information services empowerment of staff are important factors.

Before chalking out the agenda a quality audit or checklist is essential to know what is already in place with regard to attitudes, passions, and systems and to identify where action could be taken.

The results of the present study can be treated as quality audit. However, Quality audit in university libraries may include following points: Purpose, mission, definition of quality, desire for quality, key priorities and processes of library, support of management, resources, cost of quality, change management, customers and stakeholders, interpersonal relationship, leadership styles, educational, training and motivational factors; performance standards and indicators for customer service, market research tools to determine customer satisfaction, information technology (IT), barriers to quality services and customer driven culture, customer service and satisfaction programmes, awareness about continuous improvement, trust and teamwork, communication enablers and barriers, benchmarking

practices, staff and user orientation programmes, etc.

However, the major weakness in implementation of TQM or any other transformation is due to the fact that we put very little emphasis on personal change. In order to address the issue of personal change Total Quality People (TQP) is the need of hour. Because customer cares, marketing skills, communication skills, strategic planning and other strategies and techniques would not help unless right foundation is there. Total Quality People are the right foundation and these are people with character, integrity, good values, and a positive attitude and mindset. If there is a desire to serve then "please", "thank you", "smiles", "handshake", etc., comes a lot easier. Continuous professional development and personal competencies are essential for the growth and survival of librarianship in this information age. Human resources of the university libraries are willing and potent enough to act in line with this agenda. Major tools and techniques of TQM such as, benchmarking, organisational learning, and reengineering may help the university libraries to become serviceable, internally efficient, viable, socially desirable and effective systems.

Table 1.1: Overall Ranking of University Libraries: Spearman's Rank Method

Description	GNDL	MDUL	PAUL	HAUL	PULP	KULK	TIETL	GJUL	PULC	TA
1. Establishment	6	8	5	7	4	5	2	9	1	4.1
2. Faculties	1	5	6	3	2	7	9	8	4	4.1
3. Departments	5	7	1	4	2	6	9	8	3	4.1
4. Students enrolled	2	3	7	6	5	4	9	8	1	4.1
5. Adm. and Mgt.	8	6	3	2	4	5	7	9	1	4.2
6. Library Staff	5	7	3	2	1	6	9	8	4	4.3
7. Lib. Members	5	4	7	2	6	3	9	8	1	4.4
8. Collection	2	7	4	5	3	6	8	9	1	4.5
9. Growth in Nos.	1	4	8	5	3	7	6	9	2	4.6
10. Growth in%	3	4	9	6	5	7	1	2	8	4.6
11. Budget Total	3	7	5	2	4	6	8	9	1	4.7
12. Book Budget	3	5	9	1	4	7	6	8	2	4.7
13.Journals Budget	3	4	5	2	6	7	8	9	1	4.7

14.Contigent Bud.	5	6	2	3	4	7	9.	8	1	4.7
15.Staff salary	1	7	3	5	2	6	9	8	4	4.7
16.% of Uni.bud.	1	4	9	7	3	6	2	8	5	4.8
17.a Salary Bud. % of Lib. bud.	8	4	9	2	7	6	5	3	1	4.9
b. Books Budget % of Lib. Bud.	7	5	9	3	6	4	2	1	8	4.9
c. Journal Budget % of Lib. Bud.	5	1	7	2	8	4	6	9	3	4.9
d. Contigency % of Lib. Bud.	8	7	3	4	5	9	6	2	1	4.9
18. Building	5	4	3	2	6	7	9	8	1	4.10
19. Facilities	7	4	3	1	5	6	8	9	2	4.11
20. Services	4	8	3	2	6	7	5	9	1	4.12
21. IT application level	1	6	8	7	5	4	3	9	2	4.13 -22
22.Use Statistics	7	6	3	2	4	5	9	8	1	4.23
23.Cost Analysis	7	2	9	8	5	3	1	6	4	4.24
24.Resource generation	8	9	3	2	4	5	6	7	1	4.25
25. Leadership Taskoriented	9	8	1	2	7	4	5	6	3	4.26
26. Authoritarian	1	2	7	4	3	6	9	5	8	4.27
27.Nurturant	9	8	2	5	3	4	1	6	7	4.28
28.Participatory	9	8	3	7	4	1	2	5	6	4.30
29.Bureaucratic	1	2	7	5	3	6	4	8	9	4.29
30.Importance of leadership	5	7	3	4	6	2	1	8	9	4.32
31.Policy and Strategy	9	4	7	3	1	2	6	5	8	4.32
32.Staff Management	9	8	1	4	3	2	6	7	5	4.32
33.Tangibles	9	8	1	3	4	2	5	6	7	4.32
34.Processes	9	8	5	1	2	7	4	3	6	4.32
35.Quality philosphy	7	9	4	1	8	6	5	3	2	5.1
36.Reward and Recognistion	7	9	3	1	8	7	2	4	5	5.2

37.Work Culture	6	9	2	1	8	6	3	5	4	5.3
38.Pride of workmanship	7	9	2	3	8	6	4	5	1	5.4
39.Education and Training	2	9	5	1	7	2	4	8	3	5.5
40aLeadershipstaff7 ViewsTask ori.		9	1	2	8	6	5	4	3	5.6
b.Authoritarian	2	1	7	9	3	6	5	8	4	5.6
c.Nurturant	7	9	1	2	8	4	6	5	3	5.6
d.Bureaucratic	3	5	6	1	7	9	2	8	4	5.6
e.Paricipatory	7	9	2	3	8	5	6	1	4	5.6
f.Satisfaction	8	9	2	1	7	4	6	3	5	5.6
41.Collection quality	6	3	8	1	5	4	7	9	2	6.1
42.Staff quality	4	9	1	2	5	7	8	6	3	6.2
43.Staff Asst.	5	7	1	2	4	8	9	6	3	6.3
44.Knowledge & skills	5	7	1	2	6	9	8	4	3	6.4
45.User satisfaction	5	6	3	1	4	7	9	8	2	6.8
46.Gap per &exp.	7	3	2	4	5	9	8	6	1	6.5 -6
47.Total score	282	332	231	168	260	267	304	342	184	
48.Mean score Rank	5.222	6.148	4.277	3.111	4.814	4.944	5.629	6.333	3.407	
49.Rank	6	8	3	1	4	5	7	9	2	

32

Application of Total Quality Management to the University Libraries for Quality, Impact and Survival

K.C.DABAS*
SEWA SINGH**

ABSTRACT

TQM is a management philosophy embracing all activities through which the needs of the customer and the community, and the objectives of the organisations are satisfied in the most efficient and cost-effective way by maximising the potential of all employees. The key word 'Quality' in TQM is the objective of TQM and the contents of TQM are the means to achieve quality and total quality for impact and survival. After defining TQM, an attempt has been made to explore theoretical and practical literature and research studies on TQM and related library evaluation concepts to form the foundations upon which this research work is built. The existing knowledge of TQM has been organised to evolve an edifice of knowledge to show the rationale for the present study. Finally objectives, hypotheses, methodology and a conceptual framework for analysis is derived. In addition to define, determine, and explore the application of TQM in university libraries, the study aims to understand the implementation process of TQM and to propose a framework of action plan for the implementation of TQM in all the nine libraries under study.

The scope of this research paper is limited to application of TQM to the university libraries in Punjab, Haryana and

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Chandigarh. The respondent population of library staff includes the Librarians, the Deputy Librarians, and the Assistant Librarians, *i.e.* 100 percent of the population of all the nine university libraries. The user population includes students (Post-graduate, M.Phil and research scholars), faculty members and 10 percent of the population of all these categories of users.

33

Strategies for Marketing of Information

B.S. BIRADAR*

ABSTRACT

This paper discusses the importance of marketing in libraries considered as non-profit organisations. It mentions the strategies to be adopted and pricing policies for marketing of information.

1. INTRODUCTION

The market is a reality in our everyday life. There are practically no divergent views as to why a market should be there or what a market does or what exactly takes place in a market or who are all the players in a market? Everyone agrees to the point that market is a place, which serves the people in more than one ways.

The concept of marketing is considered to be associated with commercial products where the prime concern is to maximise profit. Therefore, marketing is considered to be more closely related with selling. The concept of marketing has changed now. It is more than selling—starting from planning to delivery of products which includes selling also. Libraries do not earn profits. Benefits of libraries are intangible. Hence traditionally it is difficult to think of marketing in libraries generally considered as non-profit organisations. But, the concept of marketing is equally applicable to non-profit organisations also. Marketing activities of non-profit organisation are referred to as social marketing activities. The basic concept of conventional marketing and that of non-profit or social marketing are not different. The only difference is that in non-profit or social marketing the objective is not for profit in

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terms of money. The value is measured in terms of the persons responding to the cause that is being marketed. The methods of both type of marketing are more or less the same. Marketing of non-profit organisation is the concept of sensitively serving and satisfying human needs.

The marketing concept that was developed in 1950s now counts many business firms as its practitioners. The marketing concept holds that the problem of all business firms in the age of abundance is to develop customer loyalties and satisfaction, and the key to this problem is to focus on the customers needs.

2. MEANING AND DEFINITION OF MARKETING

The following two definitions of Marketing are suitable for operational definitions.

"Marketing is identifying the targeted users and their needs, making sure your services fit the targeted users needs and promoting services to the targeted users".

"Marketing is an appropriate attitude and approach that matches products with market segment needs and has set of tools, techniques and concepts."

The essence of two operational definitions point at knowing the users and their needs, matching services to their needs as the process of marketing.

3. NEED FOR MARKETING

Firstly, information centres invest huge funds on collection, processing and storage of information resources and these resources are put to very meager use, which implies wastage of funds. Secondly, as society has begun to value information more than ever before, the so-called information industry comprising different sectors which encompass publishers, software developers, online information services and other business that package and sell information products for a profit. Since technology has changed and allowed new ways of creating, storing, organising, and providing information, public expectations of the role of libraries have increased. The librarians have to work in the information industry as sales people. For the promotion of the use of information resources, librarian has to act as a public relations officer. In addition, there are many reasons why the

information officer should go into the market place. There may be summarised below:

(*i*) Information is identified as the fifth need of human beings after air, water, food and shelter.

(*ii*)Advancement of computer and telecommunication technologies and their applications for information handling.

(*iii* Large volume of information available in digital form.

(*iv*) Increasing member of national and international level databases in all disciplines.

(*v*) Increasing cost of information

(*vi*) Increasing resource constraints

(*vii*)Increasing public sponsorship

(*viii*)Optimum utilisation of resources

(*ix*) Requirement of meeting the information needs of the clientele

(*x*) To generate revenue to ensure and sustain the growth and development of library and information centres.

Marketing creates demand for information and improves the image of the information centres and status of information providers.

4. MARKETING STRATEGIES

Public relations officer has to consider the following points at the time of preparing marketing strategies.

(*i*) Identify the potential users (internal and external) in relation to their resources and facilities.

(*ii*) Understanding the information needs of such users more accurately and precisely.

(*iii*)Extol the capabilities of the services.

(*iv*) Gain a user co-operation.

(*v*) Create a demand for products by wide publicity.

(*vi*) Develop necessary strategies to create demand for information.

(*vii*)Make new services or products acceptable.

(*viii*)Generate information product and services that are tailored to meet the exact needs of users.

(*ix*) Proper training of LIS professionals to acquire necessary skills and tactics.

(*x*) Look out for partnerships and alliances for information sharing and competencies.

Kotler[1] has identified the following six approaches to improve service productivity

i Service providers to work harder and skillfully through better selection and training procedure.

ii Increase the quantity of service while balancing with quality (*eg* , A doctor seeing more patients than before)

iii "Industrialise the service" with standardisation of procedures and adding equipment.

iv Reduce the need for a service by innovative product solutions.

v Designing more effective service.

vi To present customers with incentives to substitute their own labour for providers labour.

5. PRICING METHODS

Quite a large number of pricing methods may be found in literature, Among those Zais[2] pricing method is given below.

5.1 Cost-Based pricing

The price is set largely on the basis of cost of producing the service or product. All costs are included usually with an arbitrary figure for overheads.

5.2 Average cost pricing

All fixed and variable costs are taken into account and a single price common to all buyers is arrived at.

5.3 Marginal cost pricing

It is the ratio of the increase in cost to the increase in output for a small increment in output. It is generally lower than average cost.

5.4 Demand-based pricing

Price is based on what the user will bear or on the perceived value of the product/service. Lower prices are charged where demand is weak and higher prices where demand is intensive. even though unit costs may be the same in both cases.

5.5 Price discrimination

The product is sold at two or more prices with the price differentials not necessarily corresponding to differences in cost of production.

5.6 Competition-based pricing

The price is based on what competitors are charging for the same products or services.

6. CONCLUSION

Advanced countries are reaping the fruits of information industry; the under developed countries are still not conscious of the utilities, potentialities and indispensability of information. In view of this, it is the right time to think about pros and cons of marketing of information very seriously. Where the information should be marketed with/without price tag, with profit motive or without profit motive.

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34

Marketing Management : Implications for Implementation in Libraries and Information Centres

PADMAMMA S.*

ABSTRACT

This paper highlights on the various, aspects of marketing activities, principles of marketing management, designing marketing strategy, marketing role in non-profit organisation, strategies for information, market development, promotional activities and professional skills for marketing.It suggests measures for implementation of marketing concept in the context of Indian scenario.

1. INTRODUCTION

The path leading to information flow from the generators to the end-users is complex and beset with hurdles such as low demand, lack of facilities, etc. It is typically a chicken and egg situation and this is so in the early stage of development of an information market. It needs well-designed powerful radical measures to break away from this end. All the players in the market information providers, promoters, intermediaries and end-users have to work in unison and generate enough trust to attain the desired goal.

2. WHAT IS MARKETING?

Marketing is more than the use of certain tools like personal selling, advertising, and publicity to create or maintain demand. Rather, marketing is the skill of knowing how to plan and manage the organisation's exchange relations with its various clientele.

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There are main aurthoritative definitions of marketing management. It is defined as the analysis, planning, implementation, and control of carefully formulated programs designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organisational objectives. The organisation has to studying the target market's needs and design appropriate products and services and using effective pricing, communication and distributing to information, motivate and service the market. Marketing directs the flow of goods and services, from production to consumption. Modern marketing may be defined as the performance by an enterprise in order to create, promote and distribute products in accordance with the present or potential customers' demand and the firm's ability to produce. In this paper these definition are explained under the following headings:

- Why marketing
- Marketing Acitivities
- Principles of Marketing Management
- Marketing Techniques
- Marketing Strategy
- Creating a Market

3. WHY MARKETING ?

According to Dibb et al., an organisation that embraces the marketing concept tries to provide products that satisfy customer needs through coordinated sets of activities that also allow the organisation to achieve its goals. Customer satisfaction is the major aim of marketing cocept[6]. The marketing concept is a management philosophy that guides the way in which an organisation does business. Dibb et al., emphasise that the marketing concept is a way of thinking–a management philosophy, guiding an organisation's over all activities. The marketing concept should affect all areas and activities of the organisation and not just the marketing activities. It is therefore important that top management is fully committed to the marketing concept the and that. it forms the basis for all goals and decisions within the organisation. At the core of the marketing concept is customer focus.

The customer focus of the marketing concept is further

developed in the definition of marketing offered by Dibb et al., to accommodate not only the customer, but also the two-way exchange relationship between the seller and customer. Marketing consists of individual and organisational activities that facilitate and expedite satisfying exchange relationships in a dynamic environment through the creation, distribution, promotion and pricing of goods, services and ideas. This exchange relationship can be shown in the diagrams.

FIG. 1 : Marketing Exchange Relationship

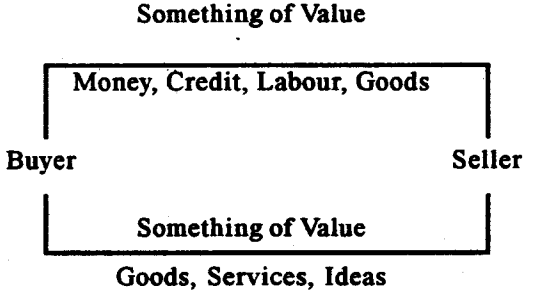
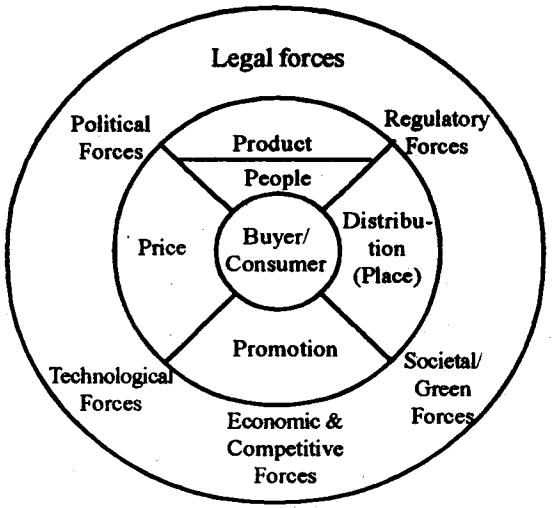


Fig.2 : A Perspective on Marketing



4. MARKETING ACTIVITIES

Marketing involves a gamut of activities which include the following:

4.1 Market Research

It is necessary to find out the facts about the market so that decisions can be based on factual information and not on guess work.

4.2 Product Planning

The planning should ensure that it satisfies the customers and enables the enterprise to use its productive capacity fully.

4.3 Pricing

The price should be based on the basis of costs as well as market factors such as, distribution channels used, discount structure applicable, level of prices of competitors' products, ability or willingness of customers to pay and so on.

4.4 Advertising

Advertising brings the customer to the product.

4.5 Sales Promotion

Sales promotion stimulates demand and increases sales. Usually sales promotion moves the product towards the customers.

4.6 Distribution

The objective should be to make the product easily available and easy to buy.

These activities can be implemented for library services according to requirement.

5. PRINCIPLES OF MARKETING MANAGEMENT

The first principle of marketing management is that *the company must have an active attitude towards the market*. It cannot expect customer to buy a product simply because it is produced. The marketeer must actively study the market, persuade customers, promote the product and organise distribution.

The second principle is that *the management of an enterprise must recognise that marketing should be given at least as much*

importance as other basic managerial functions such as administration, production and finance.

The third principle is that *the marketing function must be "integrated"* with all management activites. This means that the various marketing considerations (such as customer preferences, competition, distribution, etc.) must be taken into account in the decisions of all the managers and not only those directly concerned with sales.

5.1. Marketing Techniques

The management is required to control the application of a range of skills and techniques in marketing, generally derived from practical industrial experience and from modern social sciences such as economics, statistics and applied psychology. Marketing skills and techniques can be divided into four broad groups.

(*i*) Those used in order to obtain data about the market

(*ii*) Those used to create and stimulate demand

(*iii*) Those used to analyse costs and other marketing factors

(*iv*) Other practical skills and techniques

5.2 Marketing Strategy

Few enterprises can afford to use all the marketing techniques. Furthermore, different situations require different techniques.

The marketing manager must be able to select those techniques which are necessary for a particular product in a particular situation. Therefore, successful marketing includes the art of deciding which techniques to use in different situations.

6. CREATING A MARKET

It describes how the appropriate marketing techniques must be selected. The proper and active use of marketing technique provides the possibility of creating a market. Here are three examples.

(*i*) A market can be created by increasing the present volume of sales. If a manufacturer gathers the data on the potential market *i.e.* what the customers want, where they want and what attracts them, and if, using this information he designs desirable products and puts them into convenient and attractive packages, and makes the right pricing decisions,

his sales may increase and perhaps his profits as well.

(*ii*) Creating a market can mean waking up a sleeping market. It is to recognise that the potential market exists, the product is desirable and many people would want it, if they knew enough about its advantages. Such situations occur quite frequently in cosmetics, pharmaceutical goods, household supplies such as cleaners and detergents and so on. When manufacturers develop such products or acquire the rights from abroad, their problem is to awaken and stimulate the demand.

(*iii*) Creating a market can involve creating a demand that did not exist at all while the invention of nylon and other synthetic fibers had established the technical possibilities of making various new products, it was through marketing activities that the vast market for such products as seamless stockings, stretch fabrics and new textiles was created.

Thus, the products are made and the market is created as a result of effective marketing strategy.

7. DESIGNING MARKETING STRATEGY

The inputs available from product testing would be used to generate the likely

(*i*) Target segments

(*ii*) Positioning of a specific product / service in the target marketplace

(*iii*) Marketing mix for test marketing

In future products / services from outside supliers directly or through their agents (like Informatics India) will be increasingly available. The extent and nature of competition is, therefore, needed to be assessed before deciding the target market segments and the desired position in the selected segments. Each segment position option would require a different marketing mix composition, *i.e.*, product (including brand name), price, promotion and place.

Decision would be needed on the budget for testing the market, the marketing strategy, particularly the promotion (what message, what media, for which target segments), and distribution (direct mail / electronic mail, use of information intermediaries, etc.). Some field testing of brand name and message on representative sample

of 10 to 15 respondents in each major segment mught have to be undertaken before finalising the strategy. The consultants would assess these strategic options within the requirements of target segments, competitive situation and our own situation. Small research effort might be required to fine the strategy.

8. MARKETING ROLE IN NON-PROFIT ORGANISATION

Marketing is a subject to of growing interest to non-profit organisations too, both public and private. Hospitals, colleges, religious organisations, performing arts groups, social service organisations, libraries and other non-profit organisations have been experiencing increasing problems in the marketplace–declaiming customers, dwindling contributions, decreasing demand.

9. STRATEGIES FOR INFORMATION MARKET DEVELOPMENT

- Building up of a modern information market would require active participation of information users, individuals and institutions responsible for product development, distribution and investments. The existing library based information services may find a challenge in the immediate future.
- The market should facilitate the home users to access the world of knowledge and the foreign users to assess Indian information. A goal-of self reliance in information should not be persued.
- To generate an intrinsic strength of the market, India should have indigenous databases for national and international consumption and also arrange tie-ups with global database producers for Indian or partial database input support. A lot could be achieved simply by improving the quality and timeliness of primary publications.
- It is necessary to be aware of new developments in the international information market and identity alternative sources for accessing similar sets of information as fall back support.
- Keeping in view the economic conditions in the country, utmost effort is required to be made to optimise investments *vis-à-vis* information resource development especially where

foreign exchange is involved.

The scientific and technological information alone is not sufficient to sustain a healthy electronic information market. In keeping with the global scene, other components of the market should also grow simultaneously and the sooner it does, the better.

- The dominant role of the government as the promotor and financier of information activities would decrease. Commercial enterprises and for profit organisations may be enthused to take on more responsibilities. Besides, participation of international agencies may also be invited.
- For efficient market operations, the level of skills of information professionals, entrepreneurs and users would need to be enhanced through appropriate man-power development programmes. A facility for hands-on training for IT usage also needs to be established.
- An information Market Analysis Group (IMAG) may also be set up to continuously monitor the market trends and opportunities, emerging technologies, price fluctuations and so on.

10. EFFECTIVE PLANNING

The best strategy for developing successful promotions is to begin with planning. A good plan will clearly define the goals and objectives, identify the target audience, describe the products and specify the vehicle, (*e.g.* brochure print, and newsletter) and medium (*e.g.*, collateral, advertising, direct mail) and the strategy.

10.1. Promotional Planning Process

To begin the promotional planning process, it is a good idea to carefully review a series of important questions mentioned below that will directly help the developmental phase.

10.2. Goods and Objectives

What do you want your marketing program to accomplish in the next six months. The next one year or the next five years ? What products and services to promote ? How will its success be measured ?

10.3. Strengths and Weakness

What are the positive and negative points of the library information centres? What kind of image are they currently protecting? How would they like to be perceived? What will be the competition like? What best conducted promotional activities. have worked? What types of materials do they presently have to work with? etc.

10.4. Resource Evaluation

What type of budget do you have to work with? What type of activities can you commit to presently with the available resources? Can the library afford to use outside designers, writers or printers? Can you support in house production, desktop publishing?

The following are the key components to be considered while budgeting for promotional activities.

- Copy-writing/concept development
- Design / art direction
- Visuals – photographs / illustrations
- Type setting / artwork production
- Media costs for print ads
- Printing
- Mailing house
- Postage

10.5. Target Audience Evaluation

Who are the decision-makers users and influencers? How can you best reach key managers and users? Are there mailing lights that can be used? Here are some suggested ways to break down the target audience.

11. MARKETING CONCEPTS / TECHNIQUES

Promotional Activities

A well planned promotional programme can significantly enchance the strength and status of a library. It can help in:

- building a strong image for the library
- increasing awareness of the library's services

- stimulating first time usage of the library's products and service
- encouraging repeat usage
- educating current and potential users

Promotion can also help the information managers in increasing library's usability by allowing them to showcase their products and services directly to the target audience. In other words, promotion refers to a process and technique of communicating with the target audience in order to encourage them to the use of products and services offered by the library. It encompasses four main types of activities : advertising, personal selling, public relations and sales promotion.

12. PROFESSIONAL SKILLS FOR MARKETING

The library professional require the following professional knowledge and skills for marketing the information and library services.

- Perception of the information requirement of user.
- Knowledge of the ways of accessing information
- Promotion of information skills through various marketing strategies, distribution, advertising and user satifaction etc.
- Skills of obtaining feedback from the uses of information
- Coupling of new information with the already existing source
- Consumer interest analysis
- Understanding the reasons for potential users of information not seeking service from the system meant for them.

Marketing is a concept newly applied in the field of library and information science. As the librarians are performing the role of managers they have to understand the concept of marketing in library environment and introduces the techniques in libraries for their product and services.

13. INDIAN SCENARIO

In India some institutions are providing services free of cost and some others on the basis of nominal charges. The facilities are limited.

As far as libraries are concerned, at present every library cannot afford the expenses of technological facilities. It is

suggested that government may provide sufficient infrastructure to use IT facilities including Internet. If government / UGC provides Internet connectivity to all libraries either free or at discounted rates the ability to access and provide information and from all over the world will increase. It will lead to substantial improvements in the quality of library services. It also helps the libraries to create a good marketing strategy and to become more service oriented, dynamic and provide satisfaction to users.

14. SUGGESTIONS

1. Inculcate marketing / user orientation.
2. Develop skills for marketing, for designing, developing testing of products / services.
3. Understand the design and use of customer management system and market research for managing and improving the offerings.
4. The technology constrains and facilitates the delivery of information. If the person who needs the information and cannot use the technology, the marketing of the information fails.
5. Management should be sensitized to have clear and full knowlede about delivery of mechanisms.

15. CONCLUSION

Since the last decades of 20th century, the country is poised to become progressively more integratd into the global economy. Competition and pace of technological change are likely to intensify in almost all sectors of the economy. In essence the overall changed scenario could be viewed in terms of (*i*) resource crunch (*ii*) economic reforms with considerable extent of liberalisation (*iii*) globalisation of Indian economy and (*iv*) Indian Industry getting exposed to global competition.

It is an accepted fact that marketing, the last entrant of all classic business functions into the non-profit sectors, is beginning to gain importance among library and information professionals. Though, there is an expansion of professional literature in this area in recent years yet approach towards it continues to be characterised by skepticism by a large number of library community. For many, it is synonymous with selling,

advertising and promotion where in reality these constitute a few facts of marketing activities. It involves product development. pricing distribution, communication, continuous attention to the changing needs of customers, development of new products with product modification and services to meet these needs.

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35

Information Marketing : Need of the Hour

SHWETA N PANDYA*

ABSTRACT

Change is a law of life and our future depends on how we manage the change. User satisfaction is a prime goal of libraries and information centres and proper understanding about the change can definitely lead to the achievement of the goal. The paper discusses in detail one of the important levers of change, that is marketing, in the context of libraries and information centers. Need for information marketing, aim and importance of information marketing and distinguishing characteristics of services that make their marketing more challenging than products are also highlighted in this paper. A feasibility study was carried out by the author on "Marketing of library and information services and products of Smt Hansa Mehta Library"- the university library of the M S University of Baroda and the major findings and suggestions of this study are presented in the paper.

1. INTRODUCTION

Charles Kettering has aptly remarked, "the world hates change, yet it is the only thing that has brought progress." In other words, change is the law of life. Hence, if any society wants to go ahead and desires to have better future, it must embrace change willingly and adjust its steps to the uncertainties invariably associated with it. The societies that have adapted successfully to many changes thrown up by the massive technological revolution and have, as

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a consequence, scored over other languishing societies, are the ones which have, on crucial occasions, also thrown up a combination of right values, right knowledge and right action. What is equally significant, is that all these qualities were made operational at the most opportune time in their evolution. In short, the societies that have made rapid strides over the past three hundred years are those which have adapted themselves to changes — both in ideas and in actions.

This is very true about changes sweeping the library and information centres in our country during the past quarter century. Information has been moving round the globe at an unprecedented speed and it is extremely difficult, if not impossible, to keep pace with it. An excellent research article published in any part of the world can be downloaded by our computer within minutes. In view of this, single most important challenge today before our libraries is to assimilate this change as fast as they can, show this in their improved working and all this is to be done without loosing their identity. Managing change especially of such a vast magnitude and having far reaching repercussions is obviously not an easy task for the simple reason that it involves resources of the institution, processes of the new technology and emotions of the human beings associated with them.

There are various factors that may influence the change in the libraries. These factors can be both—internal as well as external. There are four major areas that constitute the contents of this change *viz.* quality, marketing, technology and costs. In order to bring about changes in these four major ingredients of change, libraries will have to assimilate change in three other respects *viz.* strategy, structure and human resource management. These three elements would determine the process of change. Finally any change to be socially beneficial and operationally effective has to be driven by value-based and competent leadership.

2. INFORMATION MARKETING

Information Marketing is one of the major levers of change in the context of libraries and information centres.The concept of information marketing is of relatively recent origin and is becoming popular day by day.

The new role of information as 'commodity' is now widely accepted and this has made its management, as a resource, necessary. Information as a commodity includes information products, information services as well as different channels that carry information.

Information marketing means creation of need and awareness of information services and products among the users. Information about what services and products a library can provide, from where these can be secured, what is the cost that one has to pay for obtaining them etc. should reach the users.

Information marketing begins with the assessment of information needs of users and ends with the satisfaction of the users. The intermediate stages consist of

(*i*) production of products and services for the users

(*ii*) use of these products and services by the users

(*iii*) getting feedback from the users about the usefulness of these services and products, and

(*iv*) modifications to be introduced in the services and products to improve them.

There are significant differences between services and products. Certain characteristics of services make their marketing more challenging. Libraries are basically service organisations. It is therefore, quite useful to consider these distinctive characteristics of services. They are :

2.1 Intangibility

Services by their very nature are intangible. They cannot be seen, touched or tested, but they can certainly be experienced when made available to the users and used by them.

2.2 Inseparability

Services are inseparable from a person or an organisation or any other source that provides them. Moreover, the production and consumption in case of tangible products are independent activities whereas in case of services, both production and consumption are inseparable and at most of the times simultaneous.

2.3 Variability

Services are highly variable because they depend on the sources which provide them and there are differences in time, quality and place where they are provided. Services vary from user to user and sometimes they vary according to need of the users. While these features pose quality problems, variability in the quality of services, largely heterogeneous in nature, cannot be avoided.

2.4 Perishability

Services cannot be stored.They must be produced on demand and cannot be inventoried.

2.5 Ownership

Ownership of services cannot be transferred as in case of products. One cannot buy and own services. Marketing of products is relatively easy because they are tangible, their supply is not perishable and quality is not highly variable. However, in the context of library and information centres, marketing of information services is very important because they take care of the promotional aspect of the library system.

Moreover, if they are carefully directed to meet specific requirements of the users, they can go a long way in improving the image of the library and can also generate resources for the library.

3. NEED OF INFORMATION MARKETING

Libraries invest huge amount on collection development, processing, storage and dissemination of available information resources. These resources, which are so expensive often remain underutilised or unutilised which amounts to wastage of money, time, energy and space. Marketing provides for optimum utilisation of information resources. Sometimes, users are not aware of their information needs and even if they are aware, they are not keen on fulfilling them. Marketing helps to facilitate need perception and understanding about the importance of information and thereby creates demand for information. Thus, information needs of the users can be better fulfilled and

satisfaction of the users gets improved. Extension of information services and products to potential users is made possible in an efficient manner with the help of marketing. Finally, the most important advantage of marketing information services and products is that these help to improve the image of libraries and status of information providers and thus, improve the satisfaction of information providers too.

4. MARKETING OF LIBRARY AND INFORMATION SERVICES AND PRODUCTS OF SMT. H M LIBRARY : A FEASIBILITY STUDY

A feasibility study was conducted for Smt. Hansa Mehta Library, which is a University Library of the Maharaja Sayajirao University of Baroda (subsequently referred to in this paper as the M S University of Baroda) and is one of the largest universities in the country. It possesses about 6.41 lakh documents, subscribes to 931 periodicals and journals, has about 56,367 bound periodicals and has registered membership of about 17,000. A distinguishing feature of this library is its excellent rare book collection. The rich collection of this library attracts not only staff and students of university, but also attracts people from industrial establishments in and around Baroda city, visitors of the city, school children and teachers, senior citizens of the city and foreign visitors as well.

The journals and periodicals have become very expensive in recent years and so are the books. Some of the journals possessed by this library are very expensive and beyond the reach of even the rich sections of the society. Therefore, even well to do individuals and industrial, trading and commercial establishments depend on this library. Thus, the utility of this library's resources stretches far beyond the need of the university community. Secondly, many information resources are being found underutilised or unutilised after spending so much on their acquisition. And thirdly, to acquire expensive books and periodicals, the grants given to the library are not sufficient. Therefore, a systematic attempt was made to study and explore the feasibility of marketing library and information services and products of Smt Hansa Mehta Library (the M S University library system).

Sample

Table-1 Broad categories and total number of sample under study

	Category of sample	Total No. of sample selected	Total No. of responses received
1	Users of Smt H M library	139	131
1.1	Teachers and research scholars of the M S University	86	80
1.2	Deposit members of Smt H M library	27	25
1.3	Non-member users of Smt H M library	26	26
2	Librarians of the libraries in the state of Gujarat and outside which market information services and product	7	6
3	The librarian (officer on special duty) of Smt H M library	1	1
	TOTAL	**147**	**138**

Thus, the total sample for the study consisted of 147 respondents out of which 138 responded, which gave a high response ratio of 93.87%.

4.1 Tools and Techniques

As the target population was quite large and literate and as the time available for data collection was rather limited, questionnaire method was used as the primary data collection tool for the study. Four different questionnaires were developed for four different categories of respondents *viz.* teachers and research scholars of the M S University of Baroda, deposit members of the library, non-member users of the library and librarians of libraries which market information services and products. A pilot study was conducted with a view to pre-test the validity of the questionnaire. Apart from getting responses through questionnaires, the librarian of Smt H M library was interviewed on the same theme and his views on the major aspects related to information marketing were sought with the objective of strengthening the study.

4.2 Data Analysis and Findings

An analysis of the data of this study leads to certain findings

regarding the feasibility of information marketing for Smt H M Library. The major finding of the study may be summarised as below:

(*i*) Almost all respondents of the first two categories *i.e.* teachers, research scholars and deposit members need information regularly and to satisfy their information requirements, they use Smt H M Library regularly. However, majority of the respondents also use other libraries in and outside Baroda city to fulfill their information needs.

(*ii*) A list of information services and products of the library that are found very important and valuable to users of all the categories and for which they are also willing to pay is given below.

- extra home reading tickets
- increased deposit amount for research scholars and deposit members
- literature search
- service charges on yearly basis
- increased photocopying charges
- bibliographies
- inter-library loan
- quality reference service
- new arrival lists

It is observed that more than 80% of research scholars and 92% of deposit members are also ready to pay library membership fee on yearly basis, which indicates that, money is not a constraint, if quality services and products are provided on time.

(*iii*)Majority of respondents are willing to pay for the value added services which are likely to be introduced in the future by the library.

Table-2 Willingness of teachers, research scholars and deposit members to pay for the information services and products if introduced in future by Smt H M Library.

	Information Service/Product	Willingness to Pay (in %)	
		Responses of teachers and research scholars	Responses of deposit members
1	CAS	73.75 (59)	72.00 (18)
2	SDI	90.00 (72)	64.00 (16)
3	Abstracting Service	81.25 (65)	6800 (17)
4	Service	67.50 (54)	56.00 (14)
5	Translation Service	57.50 (46)	56.00 (14)
6	On-Line Searches	63.75 (51)	56.00 (14)
7	CD ROM Searches	60.00 (48)	52.00 (13)
8	E-mail	75.00 (60)	60.00 (15)

N.B. Figures in brackets indicate number of respondents.

Thus, all services listed in the table, have very high potential of attracting not only more users to the library but also generating more revenues. Apart from the services mentioned, many users are willing to pay if the facilities like international library loan, reviews of literature, fax, internet etc are provided by the library.

(*iv*) The librarian of Smt H M Library has shown his views in favor of information marketing in general and for Smt H M Library in particular.

(*v*) Out of six libraries that responded to the questionnaire, three are not only promoting information services and products but are also generating considerable amount of resources. Moreover, from these three, two are academic libraries, which shows that academic libraries have already started information marketing successfully in the country.

The conclusion that can be drawn from all these findings is that it is very much feasible for Smt H M Library to market its information services and products to various categories of users.

5. IMPORTANT SUGGESTIONS OF USERS OF SMT H M LIBRARY

- The services of the library should be made prompt and accurate to save the time of the users.
- The library should subscribe to more specialised periodicals.

If it is not possible due to financial constraints, a copy of the content pages should be procured on request.

- To reduce the number of time-passers significantly and increase the number of genuine users, the library must start collecting membership charges on daily, monthly or yearly basis as the case may be.

6. SUGGESTION BY THE AUTHOR

In the light of the findings of the study, a few suggestions are offered to Smt H M Library.

- The library should focus on user-oriented information services and products and to offer such services and products, detailed surveys should be conducted from time to time.
- Appropriate training on regular interval should be provided to the library staff to maintain quality level of information services and products.
- Promotional activities like displays, book fairs, exhibitions, seminars, conferences, group discussions, workshops, lecturers, panel discussions, video shows, brochure distribution, user education programmes etc should be organised at a regular interval by the library for its actual and potential users to promote its information services and products.
- The library should be computerised as early as possible to provide prompt and accurate user-oriented services and products. Once the library becomes computerised, it is suggested that, value added services like CAS, SDI, online searches, CD-ROM searches etc should be started as early as possible with the purpose of both - promotion and resource generation.

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36

Marketing of Information Services ir .he Digital Envoirnment

I. CHANDRAIAH*

ABSTRACT

The present concept of marketing changes its face from sale or selling to the new sense of satisfying customer needs. The physically changing information resources and networking environment provides wide scope to the library professionals to strengthen themselves by generating revenue and achieve self-sufficiency. As the information and its products have been recognised as saleable products for socio-economic developments, the libraries, will have the opportunity to market them. The paper discusses different elements in the marketing mix *viz.*, product, promotion, place, price etc., in the light of digital resources. Attempts also has been made to suggest marketing strategies and the role of governments and organisations are identified in marketing library resources and services.

1. INTRODUCTION

The present concept of marketing changes its face from sale or selling to the new sense of satisfying customer needs. It is also extended from business orientation to non-profit orientation. In the words of Kotler "In recent years, the concept of marketing has been extended beyond the boundaries which traditionally characterised the discipline as a set of functions unique to corporate enterprises and applied to such non-marketing areas as family planning, health services, information services etc"[1] Marketing of information services means resorting to marketing methods and strategies in information system management. The libraries traditionally used to extending their services as non-

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profit organisation are forced to realise and identify itself that its services are saleable and there is a growing market for these services. The physically changing information resources in the libraries are creating vast scope for marketing their services to all types of its users.

The concept of information technology comprised different technologies for information handling. Communication and computer technologies are having major share in information technology. "Transmission of data, reduction of use of paper in the transactions and exchange of information, the new modes of transmitting news, entertainment and knowledge, and re-orientation of that may follow the expansion of computer assisted instructions for education and training and the spread of video disks - all these are very potential aids in achieving a break-through in the expansion of access to information."[2] The changing environment provides an opportunity to the library professional to market their information services.

The present day information professionals strengthened with network and communication technologies, have been liberated from the reliance on the library resources available locally to satisfy their user information needs. The new technological developments facilitated the professionals to access and process remote information, package and repackaging it for the remote user. It has resulted in decline or complete dependence on printed material. The library science has to be restructured according to the changing information resources and user needs.

1.1 Digital Environment

Application of Information Technology (IT) to the library profession brought a sea-change in the library services, products, principles and policies. The explosion of the Internet and information technology in general has created challenges and more opportunities for information professionals that are redefining their role for the present and the future. "The present phase with all the rapid developments in digital computers and telecommunication technologies and the networking power of Internet, Intranet and Extranets seems to be a period of rapid change - a paradigm shift for information professionals and information centres"[3]. This possibly can be viewed as a beginning of a new age for the profession. The concept of marketing of

information in the field of library science will call for changing the policy of library services. The new technologies are changing the information professionals role and the opportunities to enhance the prestige of the library. To take the advantage of the situation, information professionals' must understand the concept of marketing of information services in the light of digital information resources in the libraries.

Digital information environment can be synonymous with the terms such as digital library, electronic library or virtual library. It is also called as electronic information environment in which all the information resources are available and performed through the use of digital technology. "The concept of digital library is not merely equivalent to a digitised collection with information management tools. It is rather an environment to bring together collection, services, and the people in support of the full cycle of creation, dissemination, use and preservation of data, information"[4]. The digital library is physically unlimited and dynamic, having distributed access facility to its users. Multimedia information resources are its common feature.

Such libraries will be equipped with latest IT devices for speedy access and production of information which is an opportunity to implement marketing principles and methods. "It is a fact that the information provided helps users directly / indirectly in earning money, increasing knowledge or solving problems, etc., and thereby to earn money"[5]. Hence, information is a resource for development which can be marketed like other products. The digital environment provides wide scope for marketing the information services in the libraries.

2. AIMS OF MARKETING

Marketing in the library context shall be carried out with an aim to integrate its goals and objectives with organisational goals and objectives. The following are certain steps in strategy marketing designing in the libraries: (*a*) Identification of users (Group / individual), actual users and potential users, level of users (usage), presence of users (available at one place or geographically scattered), awareness of the user (information), cost consciousness (mode of cost payment). (*b*) Determination of the information needs. (Individual, Organisational), Product / services, Design, Development, Delivery, Feed back, Modification

and Marketing audit.

Apart from the traditional aims of marketing in the library environment and the changing governmental policies encouraging towards marketing for making libraries self-supporting, the concept of marketing is user oriented. In the words of Blaise Cronin "The key feature of the marketing model is its emphasis on satisfying first and foremost, the needs of the client"[6]. The overall concept of marketing revolves around its client.

3. NEED FOR MARKETING

Some organisations have plethora of information and some are suffering from paucity of information. Marketing is a bridge between these two. Information is increasingly recognised as a resource for development. It has to reach the people who are in need. Marketing can prove to be a successful instrument in the process of transmission. It is also proved that "the fact that information is a key resource for the economic-socio-cultural and political development of a nation is gaining increasing acceptance"[7]. Information is becoming increasingly expansive and so is its packaging and repackaging. The institutions meant for social services are being asked to become self-sufficient if they are to survive in cost considerations and competition oriented social and environmental set-up.

4. PRODUCT

The present society has recognised information as a product or resource like other resources and "information is saleable, and there is a constant market for it "[8]. Like all other products, to be saleable, information has to be what the customers want and in a form that they can easily use. Product can be viewed as either physical goods or services. It may also mean a person or place, or an organisation, or an idea etc. Generally products available in the library are in two forms physical and, Electronic / Digital

Physical forms	**Electronic / Digital forms**
Printed books and periodicals	Compact disks
Catalogues	Micro forms
Charts, Globes	Interactive audio/vedio, films, etc.
Cartographic materi-	Online databases / Networks

Manuscripts / plates etc.	Satellite TV Programmes
Translations	In house-generated packages
Compilation of Bibliographic	Repackages
Compilation of Abstracts	Linking
Compilation of Indexes	Web services / Searching
CAS / SDI services	

A product embodies a wanted and satisfying service. Digital products refer to sources of information contents that are available in electronic forms. The fast development of information Technology has provided new possibilities for librarians to introduce information technology (IT) Products and services to its customers. Majority of the libraries are developing online public Access Catalogue (OPAC) at present. Providing access to Internet or other networks create a good market to the products of the library. It also strengthens the library with the non-local information resources. Development of home pages of the library has to be encouraged to create databases on source of information pertaining to their core competencies and make this databases and sources of local information available through home-pages. This will promote digital Library services to a large extent.

Building CD-ROM databases in the library with subject specialities creates digital environment at cheaper cost and facilitates Marketing of multimedia information services instantly. Libraries should market IT products and services so that the investment made by the parent organisation will benefit its users and that the library resources are fully utilised by it market segments. Marketing of digital information products will enhance the library image as a knowledge resource centre. Libraries should adopt marketing approach in developing the Digital library environment. User satisfaction with digitised information services is an important criteria for evaluation of use of digital environment and also for its continuance to add or to develop new digital products and services.

Libraries have to play a key role in digitised information services to the Distance Education students. The quality of learning material will have very good impact on the learning process. The distance education students are generally deprived of certain facilities of learning. The structured Hyper text based

learning material help them to pursue their course easily and encourage them towards better reading. If the libraries prepare such products by knowledge management methods it will raise the library to the profit making level from the present non-profit status.

5. INTERNET AS PRODUCT

Traditionally librarians are custodians of information and information products. It has changed dramatically in digital environment from physical provider of document to the information providers. The librarian as information organiser and navigator has gained importance. Internet became the biggest library in the world in which information is not properly structured and organised. There are no standardised rules of classification or access [9]. Library professionals have to acquire knowledge about new technologies, and demonstrate how the tools and internet can be gainfully harnessed for improving library services.

Librarians need to play a greater role in identification, listing and classifying information sources and providing systematic approach to accessing the required information. Library Science Principles will be better suited to majority of the data processing methods in the Internet or the digital data with certain modifications. It is high time that librarians evolve such systems to improve their market.

6. PLACE

Library is an information dissemination system, which allows free flow of information in different channels to the users. Access and availability are the criteria for good information flow. ALibrary and its information products and services must be available wherever and whenever needed *i.e.*, they should send them wherever the customer wants them available[10]. Mode of information distribution or access to information in different channels is widening. Information networks are encouraging the multi-channel information dissemination. The following are some the distribution channels in the digital environment:

Channels of uistribution

- Compact - Disks
- Magnetic Tapes

- Networks
- CD-Databases
- Online databases
- Web and Internet
- Micro forms
- Interactive audio and video material etc.

7. PRICE

The pricing policy in libraries should not be profit oriented but, be a source for survival and promotion of their activities. As a matter of fact the restructuring of economy and the introduction of the concept of selffinancing have become of utmost importance to libraries and information centres for their existence... nay, for their survival@[12]. Pricing may not be for sale, in the digital environment but subscribing to the Online information services through networks, Compact Disk based services, fee for full text Journals, payment for Net access time etc., Apart from the indirect price, there is wide scope for direct sales in the digital libraries for such materials like, providing of selected or compiled material to the distance education students, research scholars, industries and business firms.

8. PROMOTION

Generally three types of communication channels can be used to promote the information services *viz*, advertising, personal contacts and proper atmosphere. Promotional activity is to identify the information and its products suitable to its user segments and to introduce the persons to the specific services. Mostly it is to communicate and convince the users. Promotion is a process of creating market for the product. Promotion involves mechanism by which the target groups are informed about the resources available, services and products offered by the Library/ Information Centre[13]. Essentially, the purpose of promotional activity is said to be to communicate, to convince, and to compete. Therefore, the library promotional packages need to be designed to achieve library objectives. For effective marketing of digital information products and services libraries should promote their services through different methods. Advertisement though costly is more popular. Advertisement

reach the people directly and make them aware of new products / services being offered.

The library can prepare guide to the library databases, and guide on navigating the networks. Reading list of digital information products which can the compiled within the library, will enrich the library services and make these easily available to the library users locally and outside. Such advertisements will inform potential users the new role of library as centre for information technology and its products. Advertisement through the networks enhances the library market very fast. Guided library tours for new registered members as well as those interested in the library services in is another means of promoting library services. By doing so users will be able to ask questions on IT products and services and technical operational information, that the users can not follow.

Participation in the trade of business exhibition is one of the ways to attract attention on the services of the library. The library should organise and participate in regular exhibitions, which focus on different aspects of information technology and its products with different target audience in mind. Organisation of library week also enhances the awareness and the library services in the changing technologies and its resource to promote public support to the digital environment.

9. MARKETING RESEARCH

Marketing research was found to be the most important activity for devising a sound marketing strategy and plan for carrying out the evaluation. Research could be undertaken at the strategic level and at the tactical level. It is essential for a library to conduct market research in order to determine information needs of its present and potential users and their information seeking behaviour.

With the growth of information generation, each one needs information in increasing variety and diversity of level, frequency, volume and use. This complex situation is ambiguous and heterogeneous in character. The information needs of a particular group of users and information flow from a specific situation of organisation are difficult to determine. With the advent and use of information and communication technologies in libraries, the patterns of information seeking behaviour appear

to have experienced a changed phenomenon. The users of traditional libraries and their methods of information searching are different from the digital libraries. The range of satisfying information needs varies from a traditional library to an electronic library.

Strategic marketing requires libraries to maintain an information system that collected data pertaining to library users for planning future library services. Information and data pertaining to changing information needs of library users should be compiled through regular surveys.

10. MARKETING STRATEGIES

User environmental changes that are taking place at national and international levels have and will continue to influence information needs of the users. In the present information explosion where there is wealth of information being published and transmitted through electronic media, libraries have to take measures to introduce IT products and services to cater for information needs of the society that is fast transforming toward a digital society. Libraries should develop long - term strategies to make their vision to become part of the nation-wide digital library a reality[14]. In developing a customer value strategy, libraries need to understand how the customers can be segmented on the basis of information needs. For developing marketing strategies for IT products and services, library should ensure quality in their products and services on the basis of quality standards. Library users should be able to get library services from any locations at any time through integrated on-line system. The library staff should provide friendly and personalised attention to users.

11. CONCLUSIONS

The government and the organisation have to realise the importance of digital information services and provide necessary budget provisions to equip the libraries with information technology devices to market their services more effectively. Digital products have shorter life cycle and libraries need to market those services as early as possible. The products and services should be made as an integral part of library services. Libraries must have marketing strategies to connect libraries and communities through digital information services. Marketing

strategies of digital products and services act as a driving force for achieving quality library services that meet information needs of the user community. Periodical orientation has to be provided to the librarians regarding digital information products and services for better marketing. The library managers have to take lead to prepare new products through the information generated within the organisation and more channels of communications to the users have to be established for dissemination of information. Online information services have to be extended to the business and industrial information users.

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37

Need for Marketing of Information Services and Products in Academic Libraries: with special Reference to Nagpur University Automated Information Services

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ABSTRACT

The analysis, planning, implementation, and control of carefully formulated services, programms and products designed to bring out voluntary exchanges of values for the purpose of achieving organisational objectives is termed as marketing in its new context. It is also defined as management style based on a service philosophy.

Nonprofit organisations like libraries mostly distribute services rather than physical products. The services are intangible and inseparable in nature. As library services fall in intangible category, market analysis and clientele segmentation defining their needs, depend upon how successfully academic libraries are able to understand their user demands and can develop their strategies to fulfil this need based service and market the existing facilities and services to the end-user.

Academic libraries have to still gear up for the targeted users and design their marketing strategies.

The present study is based on the recent survey of Nagpur University Automated Information Services and their awareness and utilisation patterns, among the faculty members and student community, and draws the lacunae in marketing efforts of the

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established services for reaching the targeted users.

1. INTRODUCTION

The idea of using the marketing concept for libraries and information services did not appear until the early 1970's. Pride and Ferrel[2] offer a broad definition of marketing which states that marketing consists of individual and organisational activities aimed at facilitating and expediting changes within a set of dynamic environmental forces. Epstein and Leibman define marketing as "every thing that is done to get the product to the customer, more specifically discovering and furnishing customer's wants and needs"[3].

The marketing concept is basically a management philosophy, through which an organisation tries to satisfy the needs of customers through a coordinated set of activities that, at the same time allow the organisation to achieve the goal. To accomplish this goal, an organisation needs to identify perceptions, wants, and needs of their clients. Then the products and services could be designed, or modified, to fit the needs of the user as well as the goals of the libraries.

2. CONNECTED MARKETING ACTIVITIES

There are a number of related activities connected to marketing concept. They include doing research, designing a program around the marketing mix, preparing a strategic plan, preparing a marketing plan, and performing a marketing audit. These activities fit closely together and sew as tools for managing the marketing program.

3. RESEARCH

Performing research involves gathering and analysing marketing information in order to serve the needs of the users in a better way. This information could come from a number of sources.

- Statistical data collected internally and externally can be helpful to identity the clientele and to discover their needs and the extent of the perception and utilisation of the services and products provided by the libraries.
- Reports and studies are generally available inside the libraries.
- Marketing surveys can be found outside the libraries.

- Useful information also can come by observation of present activities to determine ways in which they can be improved.
- Further the library personnel can be interviewed or a combination of observation and interview can be used.
- Another way of conducting research is through experimentation. This method is especially pertinent to use prior to purchasing a new product or subscribing to a new CD-ROM database.
- An area of research which is gaining more attention today, is the use of "focus groups": Focus groups are "well structured discussions with a specifically selected group of potential customers in order to learn their reaction to a product, a company, or an advertising campaign"[4].

The focus group usually consists of 8-12 persons who represent a cross section of the population served. This method provides a feedback from a variety of persons quickly.

4. MARKETING MIX

To formulate a marketing strategy for academic libraries, it is necessary to consider the elements of marketing mix. They include product price, place, and distribution. It is highly essential to maintain a balance between these elements to satisfy the needs of the clientele.

5. PRODUCTS AND SERVICES

In libraries and information centres, the products usually consist of the materials (handouts) and the services provided by the library to its clientele. These products like books, periodicals, literal programs, bibliographies, annual reports, statistical surveys, and compilations and services like CD-ROMs, online and off-line information retrieval services, OPAC, E-mail facilities, CAS, and SDI should be designed to serve the specific needs of the users. Over a period of time, the product's life cycle will grow, mature and decline. Because of this characteristic feature of the life cycle of any service or a product, there is a need to evaluate regularly the materials and services in libraries to determine their status.

Recent literature on marketing of libraries recognises the importance of products in libraries. It is important to remember

that the success of a product or service depends not only on its quality and design but also on the demand by its users.

6. PRICE

The price element in libraries may include actual cost of the service or product such as photocopying charge; or it can be of on monetary charge. Non-monetary costs include psychological, time and location impediments, if one of these barriers marks the service inconvenient, there are chances of the service being little used or never used. In order to set the price, library administrators need to look at the objectives of the institution. For example, one objective may be to charge as little as possible for online database searching, so that many clientele can take advantage of it. Sometimes library administrators can also adopt to charge an additional fee beyond the actual cost, especially for persons who are not primary clientele.

Generally, the charged service in most of the academic libraries is the photocopying service. There is a need to charge for online database searching, so that the maintenance of the products and development of new services and products on demand basis can be improved in academic libraries.

7. LOCATION AND DISTRIBUTION

Distribution of marketing mix is primarily related to the location of the library. The materials and services offered by a library need to be readily available to the users. Wood notes that "Illogical arrangement of the collection, inadequate signage, and service points with poor, locations and awkward traffic patterns are prime cause of user frustration"[5].

Current literature explores innovative ways of place, or distribution variable of marketing can be used in libraries. There are various possible innovative distribution models, like cable television to provide the users extended access to library information, after the library building closes. These distribution techniques maintain the library as provider of information, but eliminate the need for users to go to a Library building to get it.

8. ADVERTISING AND PROMOTION

This is a costly factor for libraries, but it helps the libraries to reach out to a large number of people.

9. PERSONAL SELLING AND PUBLIC RELATIONS

This consists of persuasive conversation and allows individual contact with the user. Publicity is free communication, which can be found in a news story in a newspaper, or a magazine, or public announcements in radio or television.

10. INFORMATION PACKAGING

One of the main purposes of packaging is to make the product appealing for the user. Pride and Ferrel[6] state that 'packaging involves the development of a container and a graphic design for a product' Packaging promotes the product through the use of colour, size, shape and design. Librarians can use packaging to enhance such products as brochures, bibliographies, reading lists, newsletters, posters, database searcher, and book marks.

11. PRODUCT AND SERVICE PROMOTION

One area related to promotion is called "atmospherics", speaking from a business point of view. Kotler and Anderson define atmospherics as "the conscious designing of space to create or reinforce specific effects on buyers, such as feelings of well being, safety, intimacy or awe"[7].

Accordingly, proper attention should be given in libraries to prevent overcrowding of an area with excess of materials or services and to avoid unpleasant noises especially in reading rooms. Public relations are a conscious effort to influence other people and groups through communication process. Public relations assist management of a library to receive information regarding needs of the clientele and it is a feedback mechanism to evaluate the library services and products.

12. SEGMENTATION

Targeting user groups by age, sex, occupation or geographic area is called segmentation. In promoting library materials and services, libraries usually find it useful to direct their efforts towards a specific group of user population. The segmentation of their clientele allows libraries to concentrate their energies and efforts more effectively on a particular group. In order to make the segmentation more effective, a library should be able to identify persons of certain groups and find a way of reaching the members of the groups. The segmentation process may be

changed from time to time to accommodate current circumstances and current users needs.

13. STRATEGIC PLANNING

To market the information products and service, libraries must develop a strategic plan and a marketing plan. Wood defines strategic planning as " a method of planning that matches an organisation's resources with its best opportunities. It starts with a vision of an ideal future and focuses on present conditions and actions needed to prepare and position the library for the future"[8].

Riggs has outlined several areas to be considered by librarians who are developing a strategic plan which include: a mission statement, goals, objectives, strategies, alternatives and contingencies, policies and resource allocation and their implementation and evaluation[9].

In an academic environment, faculty, students, and research scholars should be consulted regarding their curricular and research plans for the future. Brief questionnaires can be circulated to user groups and selected individual interviews can be conducted for this at regular periods of intervals.

Some libraries choose to have planning committees to work on strategic planning. This helps to input experiences and expertise of key professionals to evaluate critically the departments and functioning of the library.

A basic model of library services in an electronic environment consists of four basic functions of libraries :

(*i*) Providing access to the content of local resources (*e.g.* books, periodicals, and electronic resources) that is part of the library's collection.

(*ii*) Offering gateway access to remote resources, including the ability to obtain copies in print and electronic formats.

(*iii*)Facilitating off-site electronic access to local and remote resources from user homes, offices and schools.

(*iv*) Providing human assistance in locating information.

It is important to remember that when a library is automated, it is not only learning how to use an automated system; but also teaming new jobs which are being performed. Fortunately, at all levels such as in the analysis of operation, the identificatioin of

needs, the setting of priorities, the development of specifications and the evaluation of system the staff will gain much knowledge as the planning progresses.

14. SPECIALISED STAFF TRAINING

The impact of the internet and the World Wide Web on automated library systems has resulted in the need for staff development programs and use of tools needed for the creation of "virtual" library. The creation and design of web pages requires significant training in the use of electronic authoring tools and data encoding schemes.

Training in these specialised areas may be done in-house,but may also require an investment in supplier-run training classes, either on or off-site.

15. TRAINING THE PUBLIC

Public relations is not the first vehicle that comes to mind when we think of training the public, but public acceptance and enthusiasm for the new automated system is an important ingredient in a successful planning effort.

Public relations can accomplish three things:

(*i*) It can make users aware of the new systems and services.

(*ii*) It can motivate them to use the system

(*iii*) It can train them in using the new systems and services effectively.

Whenever possible, specific user groups should be identified and customised training should be provided.

16. A SURVEY OF NAGPUR UNIVERSITY AUTOMATED SERVICES

To assess the existing automated services and their utilisation, and to emphasise the need for marketing of the automated services and the products in academic libraries, as a case study, the recent survey of Nagpur University Automated Services to study the utilisation, and useers' perception is presented in this paper.

16.1 UGC Grants to Nagpur University Library

Since its establishment in 1956, UGC has been providing

substantial grants to the Nagpur University library for purchasing library books and periodicals. On a few occasions, Nagpur University library has also received some special grant from UGC for development of special collections, and equipment.

During the 6th Five-Year Plan period the UGC Committee visited Nagpur University library from 2nd to 4th Feb. 1983, The main purpose of this visit was to examine development proposals and to assess the requirements of Nagpur University. During the 8th Five-Year Plan (1990-95) Nagpur University library received Rs. 50,00,000 for modernisation. Subsequently during the 9th Five-Year Plan the UGC grant amounted to Rs. 22,00,000.

UGC Grants To Nagpur University Library during Five Year Plans

Table - 1

Five Year Plan	Period	Grant Rs.
1st	1951-56	2,00,000
2nd	1956-61	1,00,000
3rd	1961-66	4,68,000
4th	1966-71	8,35,000
5th	1974-79	30,00,000
6th	1980-85	17,40,000
7th	1985-90	10,00,000
8th	1990-95	50,00,000
9th	1995-2000	22,00,000

16.2 User Growth of Nagpur University Library

All the bonafide students of the Nagpur University and members of the faculties are eligible to become members of the library. It includes students of under graduate level, post-graduate level, research scholars, faculty members/and contributory teaching staff and non-teaching staff.

16.3 Growth of users during last five years

Table-2

Year	No. of membership
1995-96	1595
1996-97	1139
1997-98	1138
1998-99	1863
1999-2000	1989

According to the above Table in 1995-96 the total membership was 1595. In 1996-97 the membership decreased to 1139. In 1997-98 the membership was 1138 but in 1998-99 the membership increased to 1863. In 1999-2000 the total number of library members were 1989.

16.4 Computerisation of Nagpur University Library

UGC granted Rs 50 Lakh for updating library facilities in March 1995. Out of this grant; Rs. 18 lakh were utilised for purchasing books/back volumes of periodicals for various departments. Approximately Rs. 25 lakh was spent on computerising the main, as well as, the Campus Libraries. In addition, university has released 20 lakh to meet the additional requirement of modernisation of the library system.

16.4.1 LANs

Two Local Area Networks were commissioned, one in the main Library and the other at the Campus Library. The LANs were executed by Pertech Computers Ltd, Nagpur branch. Nagpur University Library has two Pentium servers (PC AT-586) with 1.2 MB Floppy +1.4 MB disk drive 525 MB CTD and 2 GB HDD. There are 6 terminals at the Main Library and 4 terminals at the Campus Library. Recently they have added 5 more terminals.

16.4.2 Online Public Access Catalogue (OPAC)

It has been decided to computerise the Campus Library initially. At the second stage, the departmental library collection will be added to the online public access catalogue. Nagpur University library has initiated the retrospective conversion of the old collection in the Main Library.

16.4.3 Internet and E-mail facilities at NUL

Nagpur university library has a facility for Intemet access to users through terminal dialup shell account registered at GIAS Mumbai server. With this type of account the users can easily exchange their E-mail with others, search receive and read millions of files stored on computers throughout the world. GIAS is also accessible Via-Net.

The Shell account at the Nagpur University Library enabled the user to access the information in the text mode only with no graphics and pictures; information about latest research papers of various electronic journals and universities; online search for product information, float questions to be answered by others; find out the latest news on any topic; find out tourist information; interesting places; etc. The Nagpur University library is planning to upgrade this facility soon to a TCP/IP account that gives the users a better and user-friendly interface.

E-mail unilib@nagpur.net.in

16.5 NUL Services

(*i*) During the past year about 42 thousand records were added to the computerised database of the Library.

(*ii*) Computerised housekeeping work was initiated at the periodical section.

(*iii*)In-house generation and pasting of barcode labels on the books acquired were started.

(*iv*) Manuscripts accession register and data entry in the Devnagari Script was also initiated.

(v) E-mail service is now provided to the Staff/research scholars.

(*vi*) The users are using world Book Encyclopaedia on CD at the Main Library.

(*vii*)Oxford English Dictionary on CD is being made available on computer as and when required by the user community.

16.5.1 Photocopying services and their charges

The photocopying services are provided, to the members of the library at the rates fixed by the library authorities and this service is rendered at both main library and campus libraries.

Table-3

Photocopying charges (Ist April 1997 to 31st March 1998)

Main Library	Income	Expenditure	Additional Amount
Main Library	518425/-	6420/-	-112375/-
Campus Library	2712400/-	12360/-	1476400/-

16.5.2 CD-ROM Databases in NU

During the year 1997-98 special collection of CD-ROM databases were added to NUL library.

Table-4

Title of the Database	Cost of the Database (In Rs.)
a) Biological Abstracts	524980/-
b) Humanities Index	54534/-
c) LISA	54003/-
Total	633517/-

16.6 Catergorisation of Library users

Table-5

Sr. No.	Type of visitors	Quality
1	Casual visitors	281
2	Reading Room visitors	3515
3	Visitors to monthly display	198
4	News papers readers	4500
5	CD-Net users	100
6	Internet users	1200

16.7 Purpose of the Study

Table five shows that maximum users in NUL are visiting the library to go through the general information like newspapers and to utilise the reading room facility available in NU library.

The reasons for conducting the users study are:

- To identify the actual strengths and weakness of library resources and services.
- To identify the levels and kinds of users' needs
- To identify faculty and student priorities for library resources and services.
- To identify the limitations or problems which seem to discourage the use of the library.
- To identify the level of involvement or participation and faculty and students in the library development program and
- To improve the organisation and planning of library services from managers and users point of view.

Since,one of the objectives of users study should be to predict future information demands and requirements, it is important that studies are not confined to establishing current requirements only but perceiving the future needs of the users.

(*i*) To examine patterns of library uses and identify gaps in use.

(*ii*) To make book selection systematic

(*iii*)To evaluate the resources.

(*iv*) To develop the need based services like documentation and information services, OPAC, CD-ROM database, online information retrieval and network,

(*v*) To promote participation in resource sharing with other libraries.

16.8 Methodology

Questionnaire, and interview methods were followed to carry out Nagpur University library services study. The survey was divided into two parts. Two types of questionnaires were prepared. In the first part, the questionnaire was given to Nagpur University library (Main and Campus Libraries) staff members and for the second part; another questionnaire was given to the users *i.e.* faculty members, students and research scholars of Nagpur University. The users were selected on the basis of random sampling. The number of the users surveyed from the different departments of main and campus library are as follows:

Table-6

Department	Profs.	Readers	Cont. Teachers	Res. Scholars	P.G. Students
Chemistry	1	3	-	3	5
Physics	2	1	-	3	8
Zoology	1	2	-	8	5
Botany	1	2	-	3	5
Pharmacy	3	-	-	-	10
Home Science	3	-	-	-	6
Library Science	-	1	5	4	10
English	2	-	-	-	8
Economics	2	-	-	-	1
Statistics	1	2	-	-	10
Total	16	11	5	21	74

The data tabulated in the different tables is in accordance with these surveyed users.

16.9 Use of library services in NUL

Nagpur University Library is one of the biggest academic libraries in Nagpur. NUL provides many servicesrdocument delivery service, reference service, interlibrary loan service, computerised circulation services, OPAC, reprography and periodicals services etc to the users.

Utilisation of Different Services Rendered by NUL

Table-7

	Services				
Department	Lending	Reference	Computersi ed	Reproya-phy	Periodi-icials
Chemistry	100%	75%	41.66%	8.33%	25%
Physics	100%	65%	53.11%	53.11%	41.66%
Zoology	100%	72.22%	66.66%	50.00%	38.88%
Botany	100%	45.45%	63.63%	36.36%	27.27%
Pharmacy	69.23%	69.23%	46.15%	23.07%	69.23%
Home Sc	100%	88.88%	88.25%	66.66%	22.22%

Library Sc	100%	94.11%	30.00%	94.11%	94.11%
English	80%	60.00%	66.66%	30.00%	20.00%
Economics	77.77%	66.66%	88.88%	22.22%	55.55%
Statistics	100%	77.77%		44.44%	33.33%

Computerised Information Services Utilisation

Table-8

Department	CD-ROM Database	E-mail	OPAC	Intemet
Chemistry	0%	33.33%	33.33%	25%
Physics	0.76%	61.53%	38.46%	46.15%
Zoology	16.66%	44.44%	38.88%	61.11%
Botany	18.18%	63.63%	36.36%	63.63%
Pharmacy	0%	46.15%	7.69%	30.76%
Home Sc.	0%	33.33%	66.66%	22.22%
Library Sc.	70.58%	35.29%	88.23%	52.94%
English	0%	10%	20%	20%
Economics	0%	33.33%	55.55%	44.44%
Statistics	0%	23.07%	53.84%	23.07%

Use of OPAC services

Table-9

Name of the Department	Use of the OPAC by users(%)
Chemistry	33.33%
Physics	88.46%
Zoology	38.88%
Botany	36.36%
Pharmacy	7.69%
Home Sc.	66.66%
Library Sc.	88.23%
English	20%
Economics	55.55%
Statistics	53.84%

Access Hours for Online CD-ROM

Sometimes it is observed that the library timings for access online and CD-ROM is not the same for all users. There is time limit for different catagories of users to use the online and CD-ROM databases.

Table-10

Users Category	Limited Access	Open Access
Professors	35.39%	64.70%
Readers	18.18%	81.81%
Lecturers	0%	100%
Contributory	0%	100%
Teacher	21.05%	78.94%
Research Scholar PG Students	100%	0%

Table 10 reveals that 35.29% Professors access limited hours for online and CD-ROM databases and 64.70% Professors access this facility without any time limit. 18.18% readers access limited hours for online and CD-ROM databases and 81.81% readers access without any time limit. 100% Lecturers and Contributory Teachers access without any time limit for online and CD-ROM databases 25.05% Research Scholars access without any time limit for online and CD-ROM databases. 100% PG student access limited hours for online and CD-ROM databases.

16.10 Users Opinion Regarding Computerised Services

Users' satisfaction is one of the main objectives of the libraries. The users are never satisfied with the different types of services provided by their libraries because different users have different information needs. So during the survey the users were asked about satisfaction level of computerised service, level and Table 11 illustrates their views about the automated information services in NUL.

Table-11

Department	Satisfied	Not Satisfied
Chemistry	25%	75%
Physics	15.38%	84.61%
Zoology	50%	50%
Botany	25%	75%
Pharmacy	76.92%	23.07%
Home Sc.	33.33%	66.66%
Library Sc.	11.76%	88.23%
English	20%	80%
Economics	44.44%	55.55%
Statistics	30.76%	69.23%

17. UTILISATION OF MARKETING TECHNIQUES TO AUGMENT N.U. LIBRARY SERVICES

Once the survey has been completed, it is necessery to examine which areas need immediate attention for augmentation. The NUL will then have to access the techniques which will be applicable and can be implemented with in the existing infratructure and resources since users' satisfaction is the major issue and according to the survey most users are not satisfied with the existing services. It may be worthwhile to start with repackaging of information according to users need and ensure quality in the product and services. More research will also be required to understand users' need.

18. CONCLUSION

Majority of Indian university libraries have automated their library services and are providing computerised information services. The use of marketing concept in libraries is a recent occurrence to get a feed back of the services rendered by these libraries or to satisfy the users'needs and demands. Marketing information requires implementation of several activities like conducting research, coordinating the element of marketing mix, segmentation for long-term effects. Most of the libraries have identified a need to implement and promote various kinds of new technologies, but there is still reluctance by many librarians to

accept marketing as a viable tool for libraries. In academic environment assessment of the users' needs and their perceptions regarding the information services rendered is the prime factor to decide the efficiency and effectiveness of the implementation these technologies and services.

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38

Human Resource Development in Libraries

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ABSTRACT

This paper recognises human resource as the most potential resource for development. Total organisational effectiveness depends largely on those human qualities which make people effective in any organisation. The necessity of HRD in libraries and the facts which need to be addressed have been discussed.

1. INTRODUCTION

Human being as a resource has been realised since time immemorial particularly during the last two decades, it has become a challenging task in each and every organisation not only to maintain a workforce that is both content and predictive but also to recognise the workers' expectations of meaningful situation.

It is needless to say that people in an organisation play a very crucial role. Henry Ford the pioneer in the field of management specialist once said "take out my building, take out my machines, and all capital but leave my men with me, I will become HenryFord again".

Thus, if we aim at a total organisation effectiveness, we have to seriously think in terms of those human interventions which make people effective in any organisation hence emerges the need of human resource development whose aim is not to create Goodman or Superman but to develop persons as sensitive,

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generous, authentic and caring individuals welladjusted to the stress, strains and demands of the organisation

2. HUMAN PROCESS

All new knowledge, emerging from pure and applied social sciences, forms the feeder stock for new practices and innovations in human resource development. In addition there is a new emphasis emerging out of this knowledge about human condition. This is being increasingly labeled as the process dimension.

In the absence of sufficient knowledge about the dynamics of human relationship, group and organisation, the preponderant concerns in creating and operating organisation have been over all objectives, tasks, technicial process, and burcaucratic structure and systems. But some of the most complex problems have emerged in the areas of organistional leadership, lack of commitment in employee, distortion of organisational goals because of individual self-interest, inter-personal conflicts, inter-group conflicts, resistance to change, and lack of flexibility. Under utilisation of employee potential, loss of human ability is to innovate.

All the aforesaid are other factors to be taken care of said problems are not fully amendable to structural solutions. The problem coupled with now knowledge about the process of human interaction among human beings and with physical reality make the understanding of these humans' proceses as essential prerequisite for responding to the issues and challenges.

Organisation being a commercial, and social entity can be seen as a human system consisting of various types and sizes of human–sub-systems. The smallest level of such human system is the individual, in relation to himself and in relation to his role in the organisation. The next level is that of the two persons systems such as supererior- sub ordinate and individual- peer- sub system.

Then come the three or more persons grouping such as a work-group, a committee, a task force or a small department such as two or more group situations may be seen as distinct level of human system. In this perspective the task of human resource development can be seen as the simultaneous development of various human sub-systems in congruence with the development of an organisation as the overall human system existing in a purposeful relationship with its environment. The new knowledge,

technique and practices can be put together in more systematised functional frameworks for organisational practice.

3. HUMAN RESOURCE DEVELOPMENT

Human resource development is a multifaceted exercise, which involves training, objective performance appraisal, carrier planning, potential development, counselling and guidance brining about an attitudinal revolution among the employee. HRD helps in improving their career prospects and helps in their level of performance in various activities that are assigned to them, in bringing about great improvements in the sense of commitment, loyalty, zeal, enthusiasm, dedication, total identification and involment of various human beings their objectives and goals.

4. HRD MECHANISMS IN LIBRARIES

The development of an employee would imply to help the individual through on-the-job coaching counselling to guide him along the proper path, encourage him to take up responsibility and challenges, supporting him whenever he needs the support, train him to feed some additional information, inclucate skills and bring out a change in his outlook and so on and so forth

In Libraries, HRD process are facilitated by the different sub systems/ mechanisms like:

4.1 Performance Appraisal

Performance refers to the degree of accomplishment of the task that makes up individuals job and is measured in terms of results. Employee development seems to be getting increasingly accepted as an objective of performance appraisal in practice. It helps the organisation in understanding the difficulties of their employee, exploring their strength and weakness and also encourages the subordinate in shouldering more and more responsibilities and challenges by acquiring modern sophisticated knowledge in the field

Performance evaluation can bring out the real performance of library staff members at present status and level. With its help that the future requirements can be attained through proper improvements. Performance appraisal would help to ascertain practice for improving and monitoring library performance.

4.2 Potential Appraisal

Potential appraisal means development of latent abilities of an individual when organisation is expanding in scales diversfying its operations introducing changes. Capabilities to perform new roles and responsibilities must continually be developed among employee. The system should make the employee suitable for any sort of job or work or situation. In other words it would convert the individual employee into a complete man (or) developed employee who may cope and adjust with any type of change, work situation and others

Its members should man such type of a system among the library staff to improve their latent abilities to ascertain valuable library services

4.3 Training

The success of any development programmes lies in a number of variables of which training is considered as important and vital among them. It is a process that involves the acquisition of skills, knowledge concepts rules and attitudes in order to increase the effectiveness of employee doing particular job

It gives an employee confidence in handling the job assigned to him to increase the quantity and quality of output through improved work methods and skills in employee trained on the job or outside the job through various training programmers to enhance, develop and update their skills and knowledge.

Training should be given to all the library staff members on routine basis on human relations, communication, time management and team development for uniformity in library procedures and services. To provide training to library professionals in Information Technology a number of short-term courses, refresher courses. workshop etc are being orgainsed in the country by different organisations.

5. TOTAL QUALITY MANAGEMENT

Total Quality Management (TQM) is a new management concept wherein quality is the driving force of the entire activity cycle from beginning to end. In academic library or research library the value added information service can only provide the conformance to the requirements of the users and user satisfaction. The value

added service can only be achieved by implementation of TQM principles in libraries. For implementation and achieving total quality for the system, the library executives have to understand the core concepts of TQM themselves and have to be trained in this philosophy and technique

6. QUALITY CIRCLES

It means small group of employee in the same work area or doing similar type of work who voluntarily meet regularly for about an hour every week to identify, analyse and resolve work related problems not only to improve quality, productivity and the total performance of organisation but also to enrich the quality of work life of employee

If quality circles practices were adopted in libraries it would enable to ascertain practices that will add value to the library services

7. CONCLUSION

Human resource development programmes would sharpen the technical skills, intelligence, initiative, efficiency, and personal development at all levels. The government agencies, professional bodies, association like UGC, AICTE, INSDOC, NISSAT, IASLIC ILA and other organisations related to library and information science are providing training of latest information technology and by organising conference, seminar, workshop etc. HRD programmes should make sure that every one is equipped with the capacity to perform the particular task and responsibilities to the highest standards.

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39

Human Resource Development in Indian University Libraries in the New Envoirnment of Information Technology: Case Study of a University Library in Punjab

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ABSTRACT

This paper deals with the aims and objectives and the need for Human Resource Development (HRD) in general and its importance in the university libraries, in particular and discusses that the motivation of staff in the from of inservice training courses and promotions from time to time are much needed for rendering best services in an organisation. In the university libraries also, best services can be given with the help of best staff only. The paper emphasises that in order to meet the challenges of the information explosion and the interdisciplinary approach in the research these days, the library staff, should be trained to get themselves abreast with the latest information in the profession and around. They should be motivated to attend various conferences, seminars, symposia and the workshops so that they may interact with their professional colleagues and the experts and get the latest information in the profession. The parent organisations should depute them to attend such programmes. Case of the university library of Guru Nanak Dev University, Amritsar has been discussed.

1. INTRODUCTION

Among the three constituents of a library namely— books readers

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and the human resources, the last one *i.e.* 'human resources' occupies prime postion in the smooth running of libraries, as the best library. 'Human Resource' stands for employees recruited and working in an institution , organistation or a library . The term ' Human Resource Development' (HRD) also called 'Human Development' or 'Manpower Development' is concerned with knowledge , skills, competencies, attitudes, etc. of the people working in an organisation or establishment. Human Resource Management (HRM) is a broder concept concerned with the utilisation of human resources and work to achieve organisational and individual goals. Yoder and Heneman (1974) have emphasised the need for professional development in an organisation including the skills available with the tasks to be performed through hiring, placement, promotion, transfer, job restructuring and training etc[1]. Various HRD programmes are aimed at enhancing the competencies and capabilities of the staff working in an organisation. These programmes sharpen the skills, service orientation, understanding the nature of information and its importance to the user community, if these are related to the library and information science field.

2. DEFINITION OF HRD

Human Resource Development (HRD) can be defined as a process of developing skills and knowledge of employees for the successful functioning of an institution, organisation or say a library in our case .Efficiency and effectiveness of an organisation depends upon the competence of the staff working in it and their knowledge skills and attitude towards their profession. No organisation can render desirable services without the adequate and competent, qualified and skilled staff. Thus, HRD is an integral part of any organistion and is necessary to achieve the goals and objectives of that organisation.T.V. Rao, an authority in HRD Audit , defines HRD as:

A process by which the employees of an organisation are helped in a continuous, planned way, to: acquire or sharpen capabilities required to perform various functions associated with their present or expected future roles; develop their general capabilities as individuals and discover and exploit their inner potential for their own and/or organisational development purposes; develop an organisational culture in which the superior-

subordinate relationships, team work, and collaboration among sup-units are strong and contribute to the professional well- being motivation and pride of employees[2].

3. AIM OF HRD

The basic aim of HRD is to transform the organisation into a human system, to develop commitment among the employees and to integrate individual employees with the organisation. It aims at the overall development of human resources in order to contribute to the well - being of the employees, organisation and society at large[3]. The HRD gained importance with the realisation that effectiveness of an organisation depends on the efficiency of its employees. The other resources like equipment, machinery and materials can be purchased or bought, but it is difficult to get motivated human resources[4]. Thus, motivation of the employees working in an organisation is very important. HRD in a particular organisation is for more efficiency of the employees, and this is its main aim.

4. NEED FOR HRD

HRD has a significant role to play in the achievement of organisational goals and helping the organisation to strengthen and maintain the excellence it has already achieved. Good and hard working persons who are competent, committed, well-learnt with team-oriented spirit make a successful organisation. For the goals set up by the organisation and to be achieved within a specific time, HRD needs to be appropriately structured and handled competently. Human beings working at different levels in an organisation have to be trained for their jobs. They should be up-to-date in their professional knowledge and technical know-how of their jobs.

In the modern times, technological advances are taking place at a very rapid speed. The advent of computers and communication technology have brought tremendous change in the information handling management. Persons with traning in computers are required for handling the information in libraries. Of course, they should be well-versed with the techniques of library management also. Human Resource Development (HRD) helps the professionals to equip themselves to face the challenges of new technology. So, there is urgent need to train the library professionals.

There are several factors which have created the necessity for Human Resource Development. Some of these are :

- Advances in information and communication technology.
- Information explosion with the tremendous growth of published literature.
- Complex nature of information requirements of the users, as now a days there is inter-disciplinary approach to research at various levels.
- Application of total quality management at all levels .
- Computerisation of libraries on a large scale.
- To keep the professionals abreast of new developments

5. HRD IN INDIA

The first HRD department in the Indian corporate sector was started in 1975 in Larsen & Turbo[5] after recommendations by the consultants Udai Pareek and T.V. Rao from the Indian Institute of Management, Ahmedabad. In 1976, HRD departments were established by the State Bank of India and its associates . Two years afterS, Bharat Earth Movers Limited, Bangalore, one of the largest public sector companies in India established its HRD department . The importance of HRD had grown to such an extent that by mid - eightees, almost every second organisation in India had established an HRD department.

6. HRD ACTIVITIES IN LIBRARIES

The information explosion and the proliferation of published literature has made the job of library professionals more and more challenging . The library staff can face this challenge only if it is mentally prepared and also trained to do so. For this purpose, following activities should be undertaken to keep the staff abreast with the latest developments in the profession and around .

6.1 In-service Training to the Staff

Various programmes of in-service training should be orgainized in such a manner that all the professional staff members are trained in rotation for various activities going in the library. Refresher courses run by the academic staff colleges under the aegis of UGC for the senior staff, say the College Librarians and Assistant University Librarians are very helpful in this direction. Similar

courses should also be run for the junior staff (Professional Assistants and Semi - Professionals at lower level) so that they may also know about new developments in the profession.

6.2 Motivation to the Staff

The library staff should be motivated to attend various conferences, seminars, workshops, etc. in order to get exposure to the new developments in the profession. They should be encouraged to write and present papers in these conferences and seminars. Facilities for this purpose should be provided to them by the parent organisations.

6.3 Training in Computer Handling

In order to get acquainted with the library automation being undertaken these days, each and every professinal in the libraries should be trained in handling the computers in the library work. Basic computer training should be provided to them within the institutes which are imparting such traning courses. Now-a-days various professional organisations are also organising such training courses of 5 to 7 days duration. Of course , it is difficult for an individual to pay high coursefee for such courses, say Rs.3000-5000 for a 3-5 days training course, apart from boarding and lodging expenses. The parent organisations should depute their professionals to attend such training courses .

6.4 Job Satisfaction

Job satisfaction is very important factor for HRD in the libraries , because it refers to a person's feeling of satisfaction on the job which acts as a motivation to work. Positive attitude of the employees towards his/her job singnifies the job satisfaction[6] . Job satisfaction is considered as having direct effect on the successful working of an organisation. Employees working in a library should be satisfied with their jobs and the working conditions. They should get opportunities to improve their qualifications and job skills. This will benefit the organisation ultimately. They should be given promotions as and when these are due to them. This gives them a sense of job satisfaction.

7. HRD AND HUMAN RELATIONS IN UNIVERSITY LIBRARY

Human relationship in the libraries is the basis for inter-related

library work which runs like a chain and if any link of this chains is weak, the smooth running is not possible. Sincerity towards service to the users, devotion and dedication to work and loyalty to the institution are the key factors for the effective and smooth functioning of a library. For this purpose, the relations between the super-ordinates, superiors, equals and subordinates should be cordial and smooth.

8. HRD AUDIT

The HRD audit is required to assess the competence of the human beings employed as workers and managers through knowledge testing, attitudes, values testing and HRD functions assessment. This helps to discover the areas of strength in an organisation as well as areas of development, thereby strengthening the human relations effectiveness. This is quite applicable in the case of library and information centres also. The HRD should be comprehensive as far as possible. The comprehensiveness requires the involvement of all those who are working in an organisation. A suitable evaluation of the work done and various types of duties being performed by different categories of employees in an organisation has to be carried out in order to give true meaning to HRD audit. Because of its comprehensive nature, HRD audit has to depened upon multiple methods-interviews, observations, questionnaires, and analysis of records, reports and other secondary data. Till date, no specific attention is being given to HRD audit in the libraries and information centres in India, whereas the companies and other private sector units are paying due attention to this important element.

9. LIBRARIES IN THE NEW ENVIRONMENT OF INFORMATION TECHNOLOGY

Information Technology (IT) is not at our thresholds, but now it is in our houses . No one could think of the networking , artificial intelligence, expert systems , Internet and the computer chatting a few years ago. Now, it has been possible due to the revolutionary changes that have come in the filed of information and communication technology. All these developments have eliminated the geographic boundaries of the world. The world has now turned into a 'GlobaVillage'. Information available in any one part of the world can be accessed anywhere[8]. Networking at the international level has brought the researchers of the world

closer to one another. They can share their views on the Internet and other national and international networks. International networks like Internet ,Bitnet, Usenet, Janet, Euronet, Scanet etc. are the fast steps in this direction[9]. The researchers can now seek the required information immediately from terminals at their homes, offices or the Internet cafes. The communication technology and online networking have contributed equally in this area.

10. HRD IN GURU NANAK DEV UNIVERSITY, AMRITSAR

The library of Guru Nanak Dev University, Amristar has been named after great Sikh scholar Bhai Gurdas who assisted the compiler of Sri *Guru Granth Sahib* (the holy scripture of the Sikhs) Guru Arjan Dev Ji (the Fifth Guru of the Sikhs) as scribe. The University Library was started in March 1970 with initial strength of 15 staff members. The Assistants Librarian used to Head the library in 1970-71 with five Library Assistants and about equal number of Semi-Professional Juniors (SPJ) and four Library Attendants. The Library was then located in the premises of Agricultural wing of the local Khalsa College. With the creation of new teaching and research departments and construction of different buildings for these departments, need was felt for more space for the Library. As a result, the library was shifted to the local Polytechnic building and then on the first flooor of Physics Department of the University. It could find its real home only in September 1979 in the present magnificent five-storeyed building located in the middle of all the teaching and research departments. The library, however, could get one and a half floor of this huge structure. The other space is being used by some teaching departments. University press and the office of the Security officer of the University, etc.

10.1 Development of Professional Staff

As discussed above, initially in 1970-71, the library had a staff strenght of only 5 persons with one Assistant Librarian as the Incharge (Head). With the steady increase in the number of teaching and research departments and ultimately of the users of the library -students, research scholars and the teachers, the professional and the supporting staff of the library had to be incresed in order to cater the demands of the readers/users of the library. The professional development of staff in the lirbary has

been shown in Table 1:

Table-1: Professional Staff Development in Bhai Gurdas Library

Category of staff	Staff Strength			
	1970-71	1980-81	1990-91	2000-2001
I. Professional				
Librarian	-	1	1	1
Deputy Librarian	-	-	1	2
Assistant Librarian	1	1	15	14
First Library Assistant	-	3	-	-
Library Assistant	5	7	-	-
II Semi- professional				
Semi Professional Junior / Professional Assistant*	5	19	30*	31
III Technical staff				Programmer-1 Information
Computer professional	-	-	-	
Microfilm operator	-	-	1	2
Photocopying Machine operator	-	-	2	2
IV Supporting Staff				
Library Attendant / Library Restorer*	4	11	31*	31

* The asterisk mark indicates that this is the changed designation of the post .

As is apparent from the Table, there was no librarian in Bhai Gurdas Library upto 1980 and this post is still vacant from November 2000 onwards. During 1989 and 2000 also no regular librarian was appointed and only the stop - gap arrangement is continuing . The Library was being headed by either an Assistant Librarian or a Deputy Librarian upto 1980. Two posts of Deputy Librarian were filled up in 1993 and 1994, respectively. The number of posts of Assistant Librarian went to as many as 16 when the UGC decided to merge the three scales of Rs. 300-600, Rs. 400-800 and Rs. 450-900 of Librarian Assistants , First Library Assistants and the Assistant Librarians respectively to that of Rs. 700-1600 w.e.f. April 1,1980.

10.2 Developement of Semi Professional Staff

The Post of Semi Professional Junior (SPJs) was designated as

Professional Assistant in March 1992. Their number was increased from time to time initially from 5 in 1970-71 to 31 in 2000-2001. It may be mentioned here that 20 departmental libraries are working simultaneously in various teaching departments and Professional Assistants are the incharge of these libraries.

10.3 Development of Supporting Teachnical Staff

Apart from different sections of the library such as Acquisition Section, Technical Section, Circulation Section, Serials Section, Reference Section, Documentation Section, Rare Books and Manuscripts Section, four technical units are being run simultaneously for the assistance to readers, namely Photocopying Unit, Microfilming Unit, Computer Assistance Unit and the Internet Laboratory. Each Unit is being headed by a technical person trained in the respective field. Whereas the incharges of Photocopying and Microfilming Units are the technicians with Diploma in Engineering as their qualification, those of the Computer Assistance Unit and the Internet Laboratory are the degree holders in engineering and technology. It may be mentioned here that the Library Computer Center was established in 1992 and the Internet Laboratory in 1999. The Photocopying and Microfilming Units are functional since 1979 and 1993 respectively.

10.4 Development of Other Supporting Staff

The category includes Library Restorers, Library Attendants and Peons. Their number has been on increase from time to time. For example, in the initial stage, there were only 4 posts of Library Attendent in 1970-71. The nomenclature of this post was changed to library Restorers in Decenber 1988 and now their number is 31. Some of these posts are in the main library, Apart from this, there are five posts of peons / cleaners and peons-cum-Library Attendants, etc. who help the professional and techical staff in their work.

11. QUALITATIVE DEVELOPMENT OF THE STAFF

The staff of library is quite intelligent and very hard working. Many of them have improved their educational and technical qualifications during their service period as inservice candidates. Some persons working on the posts of Professional Assistants, Library Restorers have attained the qualifications of B.Lib and

Inf .Sc and M.Lib and Inf. Sc . Some have qualified themselves in the computer science with PGDCA and MCA qualifications. Some staff members have also qualified the National Eligibility Test (NET) of the UGC required for appointment to the post of College Librarian and University Assistant Librarian (a few of them have even been selected on these posts)[3]. Some professional staff members have obtained the highest professional qualification i.e. Ph.D.degree in Lib. & Inf .Sc . and Folklore Studies. Thus the staff of the Library is well qualified and takes much initiative in their professional work. Some of them contribute articles regularly in various journals, magazines and newspapers. They are also the authors of various books in different field. They also attend the conferences seminars, etc. and contribute papers although at their own expense. The University authorities should encourage them by deputing them to attend conferences seminars, etc. at the state and national level, if not at the international level .

The library schools are playing important role in the training of library professionals required in various types of libraries . Full time courses at graduate and post-graduate levels are being conducted. Apart from this, correspondence courses are also being run by library schools in some universities . P.B. Mangla[10] is of the view that in order to meet the manpower requirements of various types of libraries , the library schools in the country are expected to play the following role in their training programmes

- To provide training of a type and a level so as to meet the existing requirements of the library and information infrastructure.
- To provide necessary orientation and specialisation which can be useful to develop the infrastructure on the modern lines.

12. CONCLUSION

HRD is mainly concerned with enhancing the competencies and capabilities of the staff working in an organisation. Various programmes of HRD sharpen the skills, service rendering abilities of staff. They also help in understanding the nature of jobs, and also suggests various ways and means to improve the working of the employees in a particular organisation. HRD is required for achieving organisationals goals. Now-a-days, technological advances in computer and communication technologies have

played significant role in handling the information management activities .The staff members need motivation and in this context the in-service training at various levels is a good practice to keep them aware and updated in their jobs. The University library staff is in need of training in computer — handling of information much more so as to meet the challenges of information technology

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40

A Study of Personnel Management in Aided Arts and Science College Libraries in Manaonmaniam Sundaranar University Area

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1. INTRODUCTION

Clara W. Herbott views "The organization of a library is, therefore, of fundamental importance in the consideration of personnel administration". The most important resource of an organisation is the human resource – the people who supply the organisation with their works talent, creativity and derive – without competent people organization will either pursue inappropriate goals or find it difficult to achieve appropriate goals. Staffing is the management function that deals with the recruitment, placement, training and development of organisational members. The staffing process can be seen as a continuing step-by-step procedure to keep the organisation supplied with right people in the right position at the right time.

The steps in the process include:(*i*) human resource planning *(ii)* recruitment *(iii)* training and development *(iv)* performance appraisal *(v)* transfers *(vi)* separation etc. Research has become the most remarkable modern phenomenon of development. Library and Information science, which has developed as an independent and a vital discipline in the present century, also needs verifications, improvement and constant development through research by men of letters in the field.

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2. DEVELOPMENT OF LIBRARIES IN THE INDIAN CONTEXT

Libraries are the centres where information is collected, processed, generated and kept ready for quick dissemination. Early history of libraries reveals that in their occurrence the manuscripts of the scholars were preserved for the posterity. It was only after 12th century with the advancement of printing press, multiple copies become available. The university and college libraries are in the centre of the advancement of whole of the academic activities. The education commission 1948-49 has regarded these as heart of a university system and is being maintained with the establishment of the institutions. The U.G.C has also initiated programme of book promotion to meet the requirements at university and college level. I.F.L.A., section of university libraries, 1985 made a statement for establishing standards for the collections, the U.G.C's interest in the development of university and college libraries is bound with the objective of maintaining the standard of higher education and research. Salder's commission (1902) was the first to recognise the need of reference libraries. After the establishment of the U.G.C in 1956, its Chairman. Shri C.D.Deshmukh on the advice of Dr. S.R. Ranganathan constituted a committee in 1957. The present status of university and college libraries is more or less is based on the frame provided by the Ranganathan Committee (1965).

3. LIBRARY PERSONNEL MANAGEMENT

Personnel management is the planning coordinating and controlling of a network of an organisational-wide sub-process and facilitating sub-systems pertaining to recruitment selection, utilizations, development of, and accommodation of human resources.

The qualities of a personnel manager in the words of North Cott is, "The personnel requirements are admittedly high, but a profession which deals with so large a part of industrial life will always be held in honour and call for men and women of sterling qualities". The principles of personnel policies are*(i)* put the right man in the right place *(ii)*train everyone for the job to be done *(iii)* make the organisation a coordinated team *(iv)*supply the right tools and the right conditions of work *(v)* give security with opportunity, incentive, recognition *(vi)* look ahead, plan ahead for more and better things. The personnel's interest areas taken for study are:

1. recognition as an individual
2. Opportunity for expression or development
3. economic security
4. interest in work
5. safety, healthy working conditions
6. acceptable hours of working and adequate wages and
7. fair and efficient leadership.

4. OBJECTIVES

1. To trace the recognition as an individual.
2. To elicit the opinion of the personnel with regard to the reasons for choosing to work in the library system.
3. To study their views with regard to the pay structure and other benefits, service conditions, etc.
4. To identify the promotional chances.
5. To identify their personal involvement in organisation.

Population:

All the personnel in the thirty-three Aided Arts and Science colleges of Manonmaniam Sundaranar University Libraries are included for this study.

5. METHODOLOGY

There are few methods and techniques available in Library and Information Science. In case study method, interview technique is used to identify the personnel problems in library management. A questionnaire has been drafted and administered directly to elicit the opinions relevant to the framework of this study. The questionnaire has been so framed as to gather data on the following aspects:

i. General information about the respondents;

ii. Service particulars;

iii. Factors which motivated them to join the academic library system;

iv. Nature of their works;

v. Their pay structure and other service benefits;

vi. Administrative factors;

vii. Promotional avenues;

viii. Educational qualifications (general and professional);

xi. Participation in the professional association and staff unions; and

x. Personal problems.

6. ANALYSIS

There are 33 aided Arts and Science colleges in Manonmaniam Sundaranar University. Whole population is taken for this study. In some institutions, apart from the librarians few skilled assistants and unskilled assistants are working.

Table-1

Number of Institutions	TrainedAssistants	Untrained Assistants
33	5	28
	(15.15)	(84.8)

Percentage is given in circular brackets

Table 1 explains about the high percentage of untrained workers employed in the libraries.

Table-2

Number of assistants	1	2	3	Total
Number of Colleges	10	15	8	33

Table 2 elicits the general information about the individuals.

Table-2 (b)

Qualifications	No. of Assts.	Pay & other benefits
Below S.S.L.C	5	
S.S.L.C	8	
U.G.	4	No change
P.G.	4	
C.L.I.S.	6	
B.L.I.S.	4	
M.L.I.S.	2	

The increase in the number of assistants depends upon the strength. Number of assistants increases depending upon the strength of the student, and the very good number of volumes of books, Table 2(b) shows that the pay and other benefits donot change with qualifications.

6.1 Reasons for choosing the job:

Table -3

Out of	By Promotion	Expecting promtion	No other go	Mean of living
4	10	6	8	5
4	10	6	8	5

Table 3 elicits the factors, which motivated them to join in the academic library system. We can understand from the Table that 87.88 per cent of the library personnel entered into the library system without any interest, unwillingly the personnel are doing their allotted jobs.

Utilisation of Talents: Response to "How well does your job utilise your Talents?"

Table-4 By position and Job Level:

Type of position and Job Level	Utilization of talents					
	Not at all	Full capacity	Very well	Fairly Well	Very Little	Total
Assist. Librarian		6		4	5	15
Library Assistant	24	6	6	8	5	49
				Total		64

Table 4 explains that the library assistants not at all utilise their talents and they do not get a chance for exhibiting their talents.

There is little chance for promotion. If a person enters into the library system as a library assistant, till his retirement there is

no chance of getting promotion as librarian. In a very few institutions only they are getting promotion, if they are qualified.

Table-5

Personnel	Problems	Faced by the Librarian
Ignorant Assistants	40	62.50%
Non-Cooperation	20	31.25 %
Frustrated Assistants	4	6.25 %
Total	64	100

Table 5 shows the nature of the problems faced by the librarians. Because of the ignorant assistants the problems in the library system is high, whereas the second priority goes to the non-cooperative deeds done by the library assistants.

7. CONCLUSION

To get work done, various measures have to be adopted; mutual involvement or participation can be allowed in proper incentives or motivating devices can be used; the right things at the right moment are communicated to bring home to employees an awareness of the issues involved in the functioning of an organisation, authority to command or take decisions is delegated within certain limits, and a provision is made for career planning and development opportunities.

8. SUGGESTIONS

1. The library automation, information technology, library administration and management are too highly preferred areas for further training to the library personnel.
2. The interest in getting training in subject areas decreases with the increase in age. Therefore proper training should be given in proper time.
3. The qualification of the library assistants should be raised to remove their ignorance.
4. The number of library assistant should be increased.

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41

Strategy for Motivating Library Personnel in Times of Change: The Saamkhya Yoga Way

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ABSTRACT

The paper describes motivation, and the factors , which influence the motivation of library personnel and contribute to the effective delivery of services in libraries in times of change. It examines theories of motivation in Library and Information Science literature and suggests practical strategy for action to motivate library staff, based on the philosophy of Saamkhya Yoga. Accordingly the task of ensuring a high level of motivation among personnel requires motivation from 'within'. All concerned with library should create a work environment providing long-term work satisfaction by means of expertise and tools to perform 'nishkaama karma' and adopt the philosophy of Saamkhya Yoga in performing the assigned duty properly.

1. INTRODUCTION

Change is universal and inevitable. All organisations whether they are public or private, small or big, profit making or non-profit making, service oriented or production oriented, have to experience change at one time or another. Libraries are not an exception. Much has changed from the Library of Alexandria (second century B C) to the modern libraries. In spite of manifold changes, the library's key mission of acquiring, processing and disseminating information to satisfy the needs of its users has remained the

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same.

The rapid growth of computers, networks and the spread of electronic sources are producing an electronic revolution, necessitating change as new technologies offer opportunities to provide services in a variety of ways. Globalisation of information services is already apparent and it has provided many opportunities and challenges. But inadequate resources, declining budgets, rising costs of information resources, increasing expectations of user community and need to adopt modern technology to provide information services, characterise libraries in India.

In order to ensure successful implementation of change, libraries in India need to have knowledgeable, skilled, motivated, committed and dedicated workforce. But a general assertion is that, the work culture is on its decline. Dutta's[1] remarks "...discourteous, passive, lethargic and unhelpful attitude ..." support the passive attitude of the library personnel in providing library services. The studies conducted by Sangam, Konnur and Kattimani[2], Prasad[3], Pulla Reddy[4], Raza and Gupta[5] and Singh[6] show that employees working in library environment and similar job conditions elicit different magnitude towards overall behavior of work. May be this situation is due to individual's attitude towards, work, interest, security, recognition, human relations at work, reward and punishment, self-esteem, future prospects, ability to work, etc. Under the circumstances authorities concerned should take interest in motivating their employees because this influences performance and organisational effectiveness.

For many years researchers in the field of Management including Library and Information Science have been studying, testing, theorising and writing about motivation, its causes and effects in the work environment, towards attaining the goals of the organisation. In this paper an attempt is made to provide the strategy for motivating the library personnel in times of change based on the philosophy of 'Saamkhya yoga', by examining the theories of motivation and Library and Information Science (LIS) literature.

2. WHAT MOTIVATIONAL THEORIES SAY[7-11]

Motivation denotes a class of factors thought to be central in the determination of behavior. Its theories have not always agreed on

the exact function that concept is to serve and the functions proposed do not always correspond to the layman's view that the answer to the question, "why did he or she do that?" is necessarily to be found in motivational terms.

Three major functions have been assigned to motivation. One function is *arousal* or energisation of behavior. In this sense, it is seen as activating habits or innate tendencies, which actually mediate the specific acts that occur. A second function, closely related to the first, employs it to explain variations in the vigor with which behavior occurs; thus, when one responds very actively to weak stimuli or, alternatively, react mildly to strong stimuli, the source of the variation is sought in motivation. A third function assigned to it, is to explain the direction that behavior takes, *i.e.* why the organism does one thing rather than another. This orientation takes preference, choice, decision, goal, intention, and the like as the hallmarks of motivated behavior. It does not ignore arousal but tends to regard arousal in terms of emotion.

Currently, the views on motivation are changing. There is dissatisfaction with prior theories, and emphasis seems increasingly to be placed on cognitive factors in situations involving motivation. This reorientation is perhaps more compatible with the third function than it is with the other two. The emphasis on cognition is not new but perhaps its resurgence marks a general trend in the field of psychology away from the functionalist-behaviorist tradition and toward a cognitive one.

In general, motivation is concerned with what has been referred to as the active, as opposed to the receptive or passive, functions of mind. Thus, it is concerned with movement in space and time, either actual or potential, or with precursors of such movement in experience. Theories of motivation, then, must be concerned ultimately with action, or more precisely, with the sources and precursors of action.

Freud and McDougall saw human nature as composed of instincts. For Freud, these instincts were lodged in the 'id', and sources of energy. The personality theory of William McDougall also postulated instincts as determinants of human behaviour. It was based on motivation or purpose. He stressed that behaviour is spontaneous and that goal-directed behaviour persists for considerable periods after the initiating stimulus has disappeared.

For Lewins behaviour is perceived as a result of the interaction between the person and his immediate psychological environment.

By introducing the concept of intervening variables, Tolman related observable antecedent events to observable consequences with the independent variables: physiological drive, heredity, previous training and maturity. For Murray, all behavior is a function not only of internal needs, but also of environmental press. Thus, Murray's basic unit of personality analysis is the thema - a behavioral unit that includes the instigating situation (press) and the need - may be viscerogenic or psychogenic; overt or covert that is operating.

For Allport, traits are the major motivational constructs. For Chein, motivation is not something that exists within our bodies. It involves transaction between subject and object, transaction that requires commerce with mediating and intervening objects. Maslow viewed lower needs - physiological, safety, esteem, etc, as standing in the way of the expression of higher needs, such as self-actualisation.

Theories of motivation differ also with respect to the presumed sources of motives. All motives stem directly or indirectly from innate drives rooted in those biological mechanisms, which, through evolution assure individual and species survival. In general, motivational constructs are invoked to account for behavioral variation among individuals, or within a single individual from time to time.

There are wide differences among systems, which postulate a separate class of motivational variables. Normal language treats the casual question of human behavior and experience with an amalgam of trait and motivational terms. Early writers addressing the question of the nature of man adopted an attribution strategy, which emphasised the wants, desires, hopes, and fears of mankind. 'The Bhagawad Gita', 'The Old Testament', 'The Koran', and other such classics provide a rich source of explanations for the actions displayed by persons of every category.

Whatever be the explanations of any specific philosophical or theological concept of behavior, it is clear from the literature that a predominant theme in Western approach for many centuries was that of a struggle between powerful inner contenders for determining the course of an individual's behavior. In modern

terms, the outcome of that competition - *i.e.* the person's short and long term choices, or more generally the directions, his/her behavior takes - falls within the province of the motivational component of psychological theory.

3. WHAT LIS LITERATURE SAY?

The relationship between motivation, employment, job satisfaction and effective library services has been discussed at length and found that there exists a relation between motivation and service provision [12]. Shih's study of volunteer library staff in public libraries in Taiwan found that the strongest motivation is social responsibility, and human relationships and that there exists positive correlations between motivation and job satisfaction [13]. Davis's study of public libraries in the Cape Peninsula in South Africa examined whether staff were motivated to provide library services to users and what role if any motivation played indicated that in-service training, study incentives, continuing education and performance appraisal played a role in motivating the staff [14].

Walker [15] and Sridhar [16] used Maslow's hierarchy of needs as a model of motivation for motivating librarians. Olorunsola [17] argued for Herzberg's two-factor theory of motivation and favored job enrichment within the context of libraries. Champawat [18] showed that McGregor's theories of motivation of X and Y as relevant to the Indian library management. Abifarin's [19] investigation of the level of motivation among librarians and paraprofessionals in Nigerian university libraries reveal a general dissatisfaction with training opportunities, professional development, work environment, sabbatical leave, communication and management style and suggested librarian to go out to see what is going on in the various sections of the libraries as a practical way of motivating.

Results of the study by Nkereuwem [20] indicate that Nigerian academic library staff responds to monetary rewards to improve job attitude and work performance. Bakewell's [21] study also revealed that staff tended to be dissatisfied with pay and opportunities for promotion and liked more training and better communications. But Gradisar and Cesnovar [22] argued that this is not the case, as successful work for the attainment of the goals of the organisation does not depend only on money. Stephen [23] proposed written letters of thanks, free movie tickets, thank you

bookmarks, and remembering holidays, anniversaries and special occasions. Williamson[24] advocates staff autonomy, providing them with the training necessary to feel competent as their jobs change and fostering feelings of being connected with each other and the library.

Thapisa[25] advocates the teamwork approach rather than bureaucratic and funds it essential to study job content with a view to enriching it. Smith and Burgin[26] prefer continuing education programs for professionals and paraprofessionals. Ngaiyambe[27] recommends long-term approach wherein strength and weakness of staff has to be identified in the light of clearly stated goals and anticipation of undesirable workforce. The issue of career stagnation, in the context of motivation, has been addressed by Verill and Wickens[28] and Chapman[29] that can be solved by well-knit staff development.

Line[30] advocated for not demotivating the staff. the demotivating factors are : rigid grading, structures and hierarchies, ignoring staff, brushing aside suggestions, claiming credit for their ideas, showing no interest in staff as human, criticising but never praising, confusing and patronising staff, giving them unclear job descriptions and reporting lines, avoiding consultation, excluding them from any involvement, and being negative.

Hannabus[31] felt that at the heart of the matter, is the individual/ organization relationship, what an employee does and what is asked of the employee. In a healthy organisation a good job comprises good opportunities, good pay and good human relationships. Hence Bisco and Stone[32] proposed to bring about a change in the perception of library as a workplace, which would bring the quality of work in libraries.

4. WHAT STRATEGY IS REQUIRED ?

A claim that is often made is that "all behavior is motivated". This assertion is made for two reasons: to express a deterministic view of action, that is, all behavior is determined, in some ways, by motivational factors; and for revaluation of personal responsibility for conduct. Motivational constructs are invoked to account for behavioral variation among individuals, or within a single individual from time to time. Hence, attempts to specify and demonstrate this process of motivation cannot be answered successfully using motivational theories.

Further, the techniques employed for motivating library personnel, as discussed above centre on rewarding the personnel, *i.e.* giving incentive for the performed activity, and the kind of reward differs in set up, in nature and in the extent of results. However with respect to the adult human being, detailed and systematic analyses in terms of 'incentive motivation' have not appeared, despite considerable investigative work concentrating such human motives as achievement, affiliation, aggression, anxiety, and fear of failure, power, and others. The question is not that of rewarding; but how long it should continue? If we accept that 'every performed activity has to be rewarded, beyond a certain stage, performed activity cannot be rewarded and negativism in terms of work performance occurs'. Therefore, motivation should come from "within" (intrinsic motivation), and not from any external stimuli, the result of which will be very short.

Intrinsic motivation or motivation that comes from "within" refers to the motivational attractiveness or aversiveness of activities that are pursued or avoided because of characteristics inherent in the activities as such. The existence of intrinsic motivation is generally accepted today. It appears that the efficacy of the intrinsic motivation is in some manner associated with the fact that it seems to provide an optimal amount of novelty, change, and stimulus variability.

Also the motivational techniques so far have addressed the problem from employees' point of view and consider them as central compared to achievement of the objectives of the organisation for which they have been employed and paid. This requires a strategy that addresses the problem from both the ends. Philosophy of 'Saamkhya Yoga', as preached by Lord Shri Krishna can be made use of in motivating the library personnel.

For this Gita, tells us to live in the present (reality) as it is a base for glorious past as well as bright future that is explained in "*Karmanyevaadhikaaraste maa phaleshu kadaachana| maa karma phalaheturbhu maate sangostwa karmani*"| (you have the right to work alone, not to its fruit). This strongly advocates performing the work properly, without keeping an eye on the fruit - fruit belonging to the future and work to the present. This does not mean that we will have any right on the fruit. On the contrary it is assured for which we need not bother at all, the same as that

of third law of Newton (For every action there is equal and opposite reaction).

There cannot be any thing without reward. If the reward is for self-interest or selfish purpose. then it will harm the general welfare. Self-interest creates attachment, which will lead to poor performance and hence destruction (*Dhyaayate vishayan pumsah ... and krodaadbhavati sammoha ..).* Hence Lord Shri Krishna asks to perform the activities in a yogic way without any attachment and having equanimity in life (*Yogastha kuru karmaani ..*). This can be achieved through dedication, devotion and love in the utmost truth to attain "*Sthitaprajnatva*". For that, an individual has to have moral commitment and senses controlled, which are the gateways to perform bad activities (*Prajahati yadaa kaaman.)*. Gita ensures utmost happiness when a work is performed in the yogic way, by renouncing self-interest and selfishness (*Vihaaya kaaman ...*). Anything performed for selfishness or self-interest will not lead to peace and hence unhappiness (*Naasti buddhiryuktassya ...*).

If one reaches this level of understanding towards work one will get intrinsic motivation, even if the outside world is not conducive as this person has everything in him/her : faith in God, love etc. The person becomes the master and no longer works as a slave. Once this happens, nothing external can motivate or demotivate the person from performing the assigned work. This is the secret of everything.

In order to achieve this, one needs to have faith in two dimension 'vertical faith' in the ultimate truth (call it God or unknown super power) and 'horizontal faith' by which we start loving the whole creation of God or the unknown super power. That is "*dhaaranaat dharma mitya ahulu*" (The sole principle which sustains and nourishes the whole creation is dharma). It is not only a belief in God or the unknown super power, that belief expresses its love towards the whole creation (Kuvempu's *'vishwamaanava'* concept also proposes the same). When this happens then one will have ground to stand. Then it can be easily realized "work for work sake" or disinterested action or *'nishkaama karma'*. This is not negating the fruit. On the contrary, it is the perfect way of attaining highest fruit without dreaming for it (*Basaveshwara's 'kaayakave kailaasa' concept*). Here one is

moving from micro-level to the macro-level, from the individual welfare to the whole creation. That is why; even 'jeevan muktaa' (liberated soul) is involved in action with a view to achieve the welfare of the world.

This kind of getting motivated towards work is required of library staff. It is not difficult and requires renouncing self-interest and selfishness; and complete surrendering of oneself to the work itself. One must understand real spirituality as the only way to get motivated internally; and in no way extrinsic motivation can give fruits in the long-run and on the other hand it leads to more desires, more unhappiness and least work performance (Bhagawaan Buddha's concept of 'desire as the root cause for unhappiness'). Hence a strong character in individual needs to be cultivated. No external force can do it. It is up to the individual to adopt this strategy, which is perfect and has no side effects.

This brings in two kinds of implications: one on the authorities and the other on the part of the staff. All concerned with library should create a work environment providing long-term work satisfaction by means of expertise (including personal guidance) and tools as the level of motivation is influenced by work content, trust and the work itself. The task of ensuring a high level of staff motivation requires from library managers effective communication with personnel, encouragement of good workplace relationships, involvement of staff in the decision making process, helping staff to come to terms with change, and providing relevant training for the personnel. In addition to these, lectures and workshops that can promote real spirituality can be arranged regularly to motivate the library personnel from 'within'.

On the other hand, each of the library personnel must realise themselves of the ill effects of desires in a long-range for performing their duty promptly and that they must come out of this groove. Only then we can find changes. If this cannot take place, no theories, no techniques will work. Hence, adopting the philosophy of 'Saamkhya yoga' is one of the best strategies for providing effective library services - wheather they are library managers (top, or middle or lower) or library personnel (professional or semi-professional or non-professional) -as fruit is assured without dreaming for it.

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42

Impact of Information Technology on Human Resource Development in Library and Information Centres in Chennai : A Study

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ABSTRACT

A review of recent literature reveals a number of studies conducted on the application of Information Technology (IT) in Library and Information Centres (LICs). This paper presents a study which has been carried out by surveying the application of IT among Academic and Special library and Information Centres in and around Chennai. It has been found that majority of the Library and Information Centre have opted for IT applications. But there is still lack of interest for IT applications among the academic library professionals. Application of IT is more prominent in special library and information centres. There is need for the provision of more funds for IT applications. Training programmes on IT applications for library professionals are to be taken up earnestly.

1. INTRODUCTION

The Information Technology (IT) application tools are essential for the provision of effective, efficient and cost benefit Library and Information Services (LIS) to the Information user community and to enhance the Total Quality of Information Management (TQIM) in the present information scenario. The application of

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Information Technology (IT) in different types of libraries in India has gained sufficient momentum and it is of continuing interest to the information professionals in order to provide IT based services. On a review of literature, it was observed that a number of studies have been conducted in the application of IT in Library and Information Centres (LICs) in the recent years. The present paper presents one such study, which has been carried out by surveying the applications of IT among academic and special library and information centres in and around Chennai. There are nearly 100 academic and special institutions offering graduate and post-graduate and research programmes in various disciplines. In the libraries and information centres attached to these institutions, the application of IT is slowly implemented since late nineteen eighties and early nineties.

2. SCOPE OF THE PAPER

The study aims to analyse the impact of IT applications on human resource development in the sample of 50 each of academic and special institution libraries. The academic institutions include university and campus libraries, government professional college and polytechnic libraries, self-financing professional college libraries, government aided/autonomous arts college libraries, self-financing arts and science college libraries and the specialised library categories. The special institutions include Central Government (CSIR-Group), Central Government (Non-CSIR group), and State Government libraries, corporate sector libraries and the private sector research library categories. Issues covered in this paper include the year of intoduction IT application, impact of IT on Human Resource Development and the reasons for poor IT applications.

3. HYPOTHESES

Based on the scope of the paper, the following hypotheses have been framed:

(*i*) Majority of the academic and special library and information centres in Chennai have introduced the application of IT for better information management services.

(*ii*) Application of IT is more prominent and privileged in special libraries than in academic libraries.

(*iii*)The application of IT influences the manpower planning and

development in library and information centres.

(*iv*) Factors like, lack of finance, lack of training, etc., hinder the promotion of IT in academic and special library and information centres under study.

4. METHODOLOGY

A questionnaire has been drafted in the light of the stated scope of the paper and administered among 50 academic libraries and 50 special libraries in and around Chennai. The Tables 1 and 2 provide the quantum and nature of libraries surveyed.

5. DATA ANALYSIS AND DISCUSSION

5.1 Distribution of Questionnaires among the Sample

The Tables 1 and 2 provide quantitative data pertaining to the survey under Academic and Special Library and Information Centres in and around Chennai as indicated below.

TABLE -1

CLASSIFICATION OF ACADEMIC LIBRARY AND INFORMATION CENTRES

S.No.	Types of Libraries	No. of Libraries	Percentage
1	University and Campus Libraries	10	20%
2	Government Professional College and Polytechnic Libraries	8	16%
3	Self-Financing Professional College Libraries	14	28%
4	Government Aided/Autonomous Arts and Science College Libraries	3	6%
5	Self-financing Arts and Science College Libraries	7	14%
6	Specialised Institutions, Libraries	8	16%
	Total	**50**	**100%**

TABLE-2

CLASSIFICATION OF SPECIAL LIBRARY AND INFORMATION CENTRES

S.No.	Types of Libraries	No. of Libraries	Percentage
1	Central Government (CSIR Group) Libraries	3	6%
2	Central Government (Non-CSIR) Libraries	17	34%
3	State Government Libraries	5	10%
4	Corporate Sector Libraries	16	32%
5	Private Sector Research Institutions, Libraries	9	18%
	Total	**50**	**100%**

5.2 Year of Automation of Academic Libraries and Special Libraries

Tables 3 and 4 reveal the year of automation of the libraries under survey.

TABLE -3

Year of Automation in Academic Library and Information Centres

S. No.	Year of Automation (During the Period)	No. of Libraries	Percentage (n=50)
1	1980-1985	1	2%
2	1985-1990	10	20%
3	1990-1995	15	30%
4	After 1995	20	40%
	Total	**46**	**92%**

TABLE -4

Year of Automation in Special Library and Information Centres

S. No.	Year ofAutomation (During the Period)	No. of Libraries	Percentage (n=50)
1	1980-1985	1	2%
2	1985-1990	9	18%
3	1990-1995	16	32%
4	After 1995	21	42%
	Total	**47**	**94%**

It is seen from the Tables 3 and 4 that 92% of the Academic Libraries and 94% of the special libraries have intiated automation. However 4(8%) academic libraries 3(6%) special libraries are yet to start the application of IT. None of these libraries had IT based information handling services before 1980. It is also observed that application of IT is more prominent in special libraries than in academic libraries, thus proving one of the stated hypotheses.

5.3 Impact of IT on Human Resources Development (HRD) Policy in Academic and special Libraries

The impact of IT on HRD Policy is indicated in Table 5 with regard to academic libraries and in Table 6 with regard to special libraries in Chennai.

TABLE -5

Human Resource Development (HRD) Policy regarding IT applications in Academic Libraries

S. No.	Policy Discription	L & ICs favouring the HRD Policy	
		Number	Percentage (n=50)
1	The authority wants to appoint a computer personnel for the operation of IT applications	22	44%
2	The authority wants to appoint library professionals who know well about IT applications	22	44%

No.	Policy Discription	L & ICs favouring the HRD Policy	
		Number	Percentage (n=50)
3	The authority wants to train the library professionals in the context of IT	44	88%

TABLE -6

Human Resource Development (HRD) Policy regarding IT Applications in Special Libraries

S. No.	Policy Discription	L & ICs favouring the HRD Policy	
		Number	Percentage (n=50)
1	The authority wants to appoint a computer professional for the operation of IT applications	17	34%
2	The authority wants to appoint library professionals who know well about IT applications	15	30%
3	The authority wants to train the library professionals in the context of IT	45	90%

In 44% Academic Libraries and 34% special Libraries the authorities favour the appointment of a computer professional for the operation of IT applications. But there are authorities, 44% and 30% respectively, favouring the appointment of Library professionals. Who know well about IT application for the same work. Majority of the libraries want to train the library professionals in IT applications. Eventualy the library professionals will take over the management of IT applications in Libraries.

5.4 Reasons for poor IT applications

Table 7 and 8 provide reasons for poor IT applications in academic libraries and special libraries.

TABLE -7

Reasons for Poor IT Applications in Academic Libraries

S.No	Reasons	No. of LICs Agreeing	Percentage (n=50)
1.	Library staff members are not interested in IT adoption in the library	46	92%
2.	Lack of adequate trained staff in IT applications	44	88%
3.	Insufficient funds	33	66%
4.	Inability to absorb recurring costs	20	40%
5.	Inaccurate expectations of IT	16	32%
6.	Lack of professional recognition by the authorities of the library	14	28%
7.	No support from the authorities for IT applications in the library	13	26%
8.	Lack of co-ordination among the library staff	10	20%
9.	Library professionals are not interested in learning IT applications in the library due to poor scale of pay for them	9	18%
10.	Lack of initiative on the part of library professionals	8	16%
11.	Lack of interest on the part of the readers	7	14%
12.	Lack of scope for the library profession due to IT applications	4	8%
13.	A fear of modern IT	3	6%

TABLE -8

Reasons for Poor IT Applications in Special Libraries

S.No	Reasons	No. of LICs Agreeing	Percentage (n=50)
1.	Lack of adequate trained staff in IT applications	36	72%
2.	Inability to absorb recurring costs	33	66%
3.	Insufficient funds	31	62%
4.	Lack of professional recognition by the authorities of the library	18	36%
5.	Inaccurate expectations of IT	16	32%
6.	Lack of co-ordination among the library staff	14	28%
7.	No support from the authorities for IT applications in the library	14	28%
8.	Lack of initiative on the part of library professionals	12	24%
9.	Library professionals are not interested in learning IT applications in the library due to poor scale of pay for them	11	22%
10.	Lack of interest on the part of the readers	9	18%
11.	A fear of modern IT	8	16%
12.	Lack of scope for the library profession due to IT applications	8	16%
13.	Library staff members are not interested in IT adoption in the library	7	14%

Table 7 Shows that lack of interest among library staff members for IT adoption, lack of adequate trained staff for IT applications, insufficient funds, and inability to absorb recurring cost are the major reasons for poor IT applications as for as academic libraries

are concerned. But in the case of special libraries (Table-8) the major reason for poor IT applications are, lack of adequate trained staff in IT applications, inability to absorb recurring cost, insufficient funds and lack of recognition by the authorities of the libraries. While there is less interest among the academic library staff for IT application, the envoirnment in the special libraries has made the staff interested in IT. Lack of funds is the main problem for all kinds of libraries.

6. CONCLUSION

From the foregoing analysis and discussion, it is evident that the academic and special libraries in and around Chennai are marching towards the computerisation of their services. It is more appropriate and the need of the day in the light of emerging networks at local, regional and national level. The local level network MALIBNET and the formation of Science City in Chennai and the UGC-based network INFLIBNET have had their impact on library and information centres. Therefore, the present survey identifies a transition from manual methods of information handling to automated methods. Further, the results of the survey are positive in the direction of IT applications. However, it is also observed that a sizable number of library and information centres are yet to implement IT. Therefore, it is argued that they should also join the mainstream so as to enable them to participate in the emerging networks. It is suggested that training programmes in IT applications for library professionals are to be earnestly taken up. Enthusiasm for IT applications can be infused only through training programmes. Another immediate concern is about funds. Adequate funds are to be made available to the libraries for IT applications.

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43

Kaizen—Inexpensive Way to Develop Human Resources in Libraries

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ABSTRACT

Gemba Kaizen is of Japanese origin. Japanese management theories believe in improving inner qualities.The paper discusses the concept of Kaizen with respect to library environment. Kaizen addresses people's mind for improvement of the work culture at the lowest cost. It teaches the management how to use the existing human and other resources to improve efficiency and focuses on human effort and fosters process oriented thinking. Considering the perennial problems of Indian libraries the paper suggests some practical, commonsense approach to improve the work culture.

1. INTRODUCTION

Improvement in any sector of the economy involves cost. Reinventing or re-engineering that sector does play a major role in improving the existing situation in any organisation. Re-engineering goes along with s uncertainty for the employees and the customers as well. Re-engineering in libraries involves a disruption in user services. The inconveniences faced by the employees and the users may not be expressed in terms of loss of money but it may result in the deterioration in the work culture.

2. KAIZEN-THE ART OF IMPROVEMENT

Gemba kaizen is the inexpensive way to improve continuously. 'Gemba' means the 'real place' where the action occurs and 'Kaizen' means 'change for the better'. In libraries 'Gemba, *i.e.* the real place is the place where the user meets the service

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provider and the place where different library activities are carried out. Kaizen culture talks about simple ways as the best solutions for improving the attitude of the employees. It does not include sophisticated technology or any complex procedures. It is an inexpensive way of achieving success. Needless to say the success of a library lies in the satisfaction of the users. Kaizen helps to improve the attitude of the people through simple processes. The satisfaction of the users depends on the positive and courteous behaviour of library personnel to a large extent.

The pillars of Kaizen are standardisation, 5 S (for house keeping) and muda (waste) elimination.

2.1 Standardisation

Libraries are non-profit service organisations. The criteria for gauging the efficiency of a library depends entirely on users' feedback. The jobs of the library professionals can be considered having no slur if there is no negative comment by the users. The next step of kaizen is to improve further. For example, the professionals in the circulation desk may provide more prompt service than he/she hes been providing, to save the time of the users. The reference librarian may provide pin-pointed information to the user instead of providing only the source. The quality of the service is thus improve. If there is a complaint from any user the root cause is to be detected and has to be eliminated accordingly. For example, if a user complains about non-availability of the desired book in the specified position the employees should identify the reason behind it. Whether the book is issued or misplaced and even if it is misplaced, why is that so, these are the pertinent problems most of which commonly occur in libraries. The solutions of these perennial problems can certainly improve the quality of the library services. The solutions must involve the improvement in process also. One time solution can not improve the situation.

2.2 Five s for Good Housekeeping

The can be described in the following way. Seiri' means sorting of all unnecessary items and eliminating them. The process is to 'distinguish between necessary and unnecessary items in gemba and discard the latter'.

Seitor' means straighten i.e to arrange all items remaining

after seiri in orderly manner.

Seiso – scrub *i.e.* to keep the work environment clean.

Seiketsu – (systematise). The process 'extend the concept of cleanliness to oneself and continuously practice the above 3 steps.'

Shitsuke means to standardise the 'four steps to make the process that never ends and can be improved upon.'

2.3 5S in relation to libraries

Seiri, the first step of housekeeping involves identification of necessary and unnecessary items and removal of the latter. In traditional libraries, it is observed that some books are lying unused. They do not attract any user. Eventually, those books and their information content become obsolete. In the field of science and technology the rate of obsolescence is much faster than in other fields. So the old books can be removed from the main stack area so that place for new books can be made available. Sometimes the new edition of some volumes may replace the old ones if the latter are not needed. The library professional can also identify the books which are not issued for quite some time. A strategy can be taken up by the top management that kind this books or study materials can be removed from the main stack area 'Gemba'. Thus the unnecessary books or study materials are identified and removed from the area where only the necessary items are kept for effective use.

In case of library furniture also some extra racks, tables, chairs, catalogue cabinet are seen lying unused. Those are also unnecessary. Removal of extra furniture is necessary to keep a library neat.

The second step in gemba kaizen is seiten (straighten). Once the seiri is carried out, the unnecessary items are removed and then the process of organising the necessary items in an orderly manner comes into picture. The 'straighten process involves keeping the necessary things in their proper place'. If the book is misplaced, it may not be traced by the users or by the employees. Misplaced books or study materials may be missed forever. To avoid this a thorough seiten is the answer. Seiten also demands a clear indication of the address of the materials. For example, the call numbers have to be written legibly and

pasted very carefully so that the users do not have any problem in identifying the material. The title of the book, the authors' name, the volume number if written on the spine of the book, should not be hidden by the call number sticker.

The third step of gemba kaizen culture is seiso which means cleaning the working environment. Cleanliness is missing in most of the big libraries in India. Keeping the books and study materials dust-free, is a major challenge for the libraries. The library manager can motivate other people in clearing the racks and the work place by involving themselves in the activity. Everybody likes clean workplace and the employees feel motivated if they work in a clean library. The employees will try to keep the place clean if they themselves are involved in the cleaning process. The work should not be thrust only on the employees who are supposed to do it, for example, the peons. Everybody including the library manager should participate in the activity.

The fourth step is seiketsu implying the continued effort to work on seiri, seiton and seiso. These three steps can be carried out everyday. Kaizen does not work if it is practiced only once. The continuity is needed. For example, if seiri is carried out once in 10 years, the problem of the burden of unnecessary items will be rolved initially. But again the accumulation will start after sometime. So the steps are to be continued. A clear-cut strategy can be taken by the top management for carrying out the steps for gemba. Like other quality strategies, the top management commitment is a must for kaizen also.

The final stage is 'shitsuke' the self discipline. People performing the four steps continuously will acqure self-discipline ultimately, and then they will sustain the culture in their daily work. Self-disciplined people will automatically practice 5S in gemba. The attitude of the people, in the workplace will certainly change.

2.4 Appriasal of 5S

There are certain ways to appraise the level of the steps of housekeeping in gemba.

- self-evaluation;
- evaluation by an expert consultant.

- evaluation by the superiors;
- evaluation by the customers (users);
- competition among gemba groups;

The library authority can organise the appraisal activity, Ready-made appraisal tools are available with publishers like AMA, BTD, Par-Training etc. The library managers can also develop their own assessment t ool. It does not cost much. The situation can be understood with a view to initiate the improvement processes.

2.5 Muda (waste) elimination :

The third pillar of kaizen is the muda *i.e.* waste elimination. In seiri we have seen the elimination of the unnecessary items. Muda elimination includes not only the items but different activity also. Thaichi Ohno was the first person to recognise the enormous amount of muda that existed in gemba[1]. Muda refers to items as well as activity which do not add value. Ohno's categorisation for muda elimination can be seen with reference to the libraries in the following way.

(*i*). Muda of processing;

(*ii*). Muda of motion;

(*iii*). Muda of excessive order;

(*iv*) Muda of waiting;

(*v*). Muda of transport.

Muda of processing indicates the unnecessary work which is carried out in organising the library. The work which does not add any value to the work is considered as muda. While processing a book the elements used in bibliographic discription such as author. title etc., are to be used carefully. Any element which does not add any value for the users have to be eliminated. In a computerised library, when database is created extra precaution has to be taken to remove muda.

Muda of motion means the unproductive movement of the people inside the workplace. Any movement which is not required for actual work purpose is to be removed. Walking from one section to the other to convey messages sometimes becomes unnecessary and unproductive.

Muda of excessive order in libraries denotes unwanted lag between the delivery of books in the library and its availability for use. If processing can not keep pace with the orders, the processing section becomes a dumping place for new books. Gemba kaizen says that, the number of new books coming into the library should be processed at once. There should not be much gap between the time when the books or study materials are delivered to the library and their availability in the stack area.

Muda of waiting relates to the idle time when the hands of the people engaged in stack area becomes idle as the processing of books lags behind. If there is a synchronisation between the ordering section, processing section and the circulation section, the muda of waiting can be eliminated.

Muda of transport : If the order section and processing section and the stack area are situated away from each other, the unnecessary burden of transport of books is inevitable. That can be avoided by simply keeping the inter-related sections in close proximity to each other.

From the above discussion it is clear that the standardisation, 5S of house keeping and muda elimination in relation to different library activities are the pillars of gemba kaizen.

Masaaki Irai has suggested some basic rules for practicing kaizen in gemba.

(*i*) Discard conventional rigid thinking;

(*ii*) Think of how to do it, not why it cannot be done;

(*iii*) Do not seek excuses, start by questioning current practices.

(*iv*) Do not seek perfection. Do it right away even if for only 50 per cent of target.

(*v*) Correct mistakes at once.

(*vi*) Do not spend for kaizen.

(*vii*) Wisdom is brought out when faced with hardship

(*viii*)Ask' why?' five times and seek the root cause.

(*ix*) Seek the wisdom of ten people rather than the knowledge of one.

(*x*) Remember that opportunities for kaizen are infinite.

Gemba kaizen is of Japanese origin. Japanese management

theories believe in improving the inner qualities of human beings. Western world thinks of the cost included in the charge and the economic payback. Building self-disciplined people in the workplace is the aim of Japanese management. Libraries being non-profit organisations, the user satisfaction is the criteria for evaluating the library services. Inter-personal communication is the building stone for carrying out services. Inter-personal communication can only be successful if a highly motivated and self-disciplined team of people work in the libraries. Self-discipline can be acquired by practicing kaizen in gemba. The top management has to build a self-motivated team by selecting the people with positive attitude . The team may start work with a clear-cut obiective and strategy. They can initiate activities which will motivate others. Finally; most of the employees will become self-disciplined and practice gemba kaizen , Eventually the libraries will become nicer places for the scholars to lean on.

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44

Human Resrouce Development and Information Marketing

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ABSTRACT

Human resource development is the most essential factor for bringing about effectivenss in information services. It is fairly easy to acquire other resources of a library like equipment, furniture and documents. To put those resources into effective use, human resources need to be imparted with all the needed knowledge, skills and capabilities, and inculacated with greater motivation and commitment to cope with the advent of information technology and other changes. For this, various types of trainings of different time spans are eesntial.

The article defines human resources and personnel management, describes training programmes ecompassing methods and periods, and outlines its advantages. It also discusses marketing of information services.

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45

Computerisation of The Aligarh Muslim University Library

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ABSTRACT

This paper presents a brief account of the historical development of the Aligarh Muslim University Library, the nature of its holdings, services and the ongoing automation activities. Special reference has been made to the process of creation of the existing database of books, theses and dissertations and the hardware and software used for the purpose. It also highlights the procedure of data entry, problems in retroconversion and the precautions taken to protect the entered data.

1. INTRODUCTION

The Aligarh Muslim University was founded by Sir Syed Ahmad Khan on the pattern of the Oxford and Cambridge universities. Its main objective was to make special arrangements for the education of muslims with facilities for imparting the same type of education to students of other faiths. The University started as a small school in 1875 and grew into the Mohammadan Anglo Oriental College in 1877. It was later transformed into a university in 1920 by an Act of Parliament.

The Library of the University started with a few hunderd books donated by the founder. It has now grown into a large library system, the Aligarh Muslim University Library System with Maulana Azad Library at the centre and about one hunderd

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satellite libraries spread all over the campus. The number of volumes available in the library was about 9,65,000 at the closing of the current financial year. It subscribes to 465 foreign and 608 Indian journals. The Library is world famous for its rare and valuable collection of manuscripts, mostly in oriental languages. Researchers from all over the world visit this Library for conducting their studies.

The present collection of Maulana Azad Library has been developed over a century and during this period, it witnessed changes in the techniques of management. Presently, the holdings are divided into collections depending upon the nature of the collection and its clientele. The main collections of the Library are in English, Urdu and Hindi languages but there are books in other scripts also. The largest number of them is in English which is the medium of instruction in the Institution.

2. COMPUTERISATION

Library introduced computers way back in 1980s when reminders to the borrowers were generated automatically. In 1995, the stock verification was conducted in the automation environment which still continues. The work of database creation has rather been delayed because of some factors like the decision over the selection of software package. But it has now got a new momentum.

The basic requirements for creation of a database for the university libraries are the hardware, software and training of the library staff in preparing the bibliographical data from the documents and process the same in machine readable format.

2.1 Hardware

The Aligarh Muslim University having a large library system spread all over the campus needs an integrated type of hardware. The Library procured 10 computers, (Intel Celeran 300 mhz) alongwith a Server (Pentium- II 350 mhz) in 1999. Apart from computers, it has purchased UPS, Two printers (Deskjet, 610 C and laser 6L Gold) and an External Modem (33.6kbps). Computer nodes have been installed at all the major divisons of the library and connected with the server using Windows-NT as a net operating system (NOS). Internet connection has also been taken.

The Library has installed a Local Area Network connecting

all the terminals with server. Provision has been made to purchase the more advanced hardware for replacing the present server. keeping this in view, decision has been taken to acquire an advance model of IBM processor.

Presently the Server and five terminals have been installed in the Computer Section of the Library and all the divisions *i.e* acquisition, technical, circulation, serials and administration have also been provided one system each. All of these except Server are PC AT 486 which are used as dumb data terminals.

They may also be enhanced if needed after changing the configurations but the matter is not so urgent at this stage.

2.2 Software

In view of the huge amount of data and the complexity in the nature of services of the University Library, it was decided to purchase a software to cover as many functions of the library as possible. 'Since LibSys was found working satisfactorily in a number of institutions and it is giving Unicode also to deal with the Oriental languages, it was the unanimous choice of a committee entrusted with the work of selection of a package for the university Library.

LibSys 4 software has been installed in the library recently and as per the conditions agreed to by its supplier all the data available on the various computers has been transferred to LibSys. Presently over 60,000 records about the general collection of books, Ph.D. theses and dissertations are available on the computer system which are displayed through OPAC facility. The present rate of data entry is about 2000 records per week.

2.3 Training of Library Staff

Training is an important aspect in automation. It has been provided at three stages. The first stage is concerned with the hardware wherein staff members were exposed to the fundamentals of a computer system as a machine. The suppliers of hardware undertook the responsihilty of such a training while installing the systems.

There are various kind of software packages needed for performing different kinds of functions. Since the Library has

purchased LibSys, the training is also being provided to the staff members as per the conditions mutually agreed to.

The above types of training are comparatively shorter in period since they cover the general guidelines and there is a provision of warranty in both the cases. The most important aspect is of the training in preparing of bibliographical data and putting it into standardised formats and fields. Generally, the professional librarians are the only category of staff that are able to extract the relevant data. In AMULS, guidelines for the data entry staff are provided by the senior library staff.

3. DATA ENTRY

The most time taking process in computerisation is data entry. It needs the services of professionals trained in perparing of the bibliographical data from the documents and processing it on the computer. In case of the retrospective data, it is essential to ensure that only those documents are taken up for the task which are available in the library physically on record. Otherwise not only the precious time of staff is wasted but also the complications in automation increase. This contributes to confusion and inaction.

3.1 Retroconversion

Retroconversion of data is the main problem for AMUL. The rates for entry from books are comparatively higher and only a few libraries are able to meet the expenditure to be incurred in such a condition. In normal circumstances, the rates for such mode of data conversion range from Rs.7 to 40 per record/book, depending upon the specifications. Since book is the original source of bibliographical data, entry through books should be preferred if affordable. But for AMUL the rate of Rs.2.5/ per record has been fixed for data entry. Therefore, no private agency has come forward for the work as per the specifications.

The mode of data entry was decided before starting the entry work. The allocation of funds and the strength of collection was taken into consideration while deciding it. For a small library, data will be fed right from the books but a large library like ours needs suitable solution far a huge collection where retroconversion is the main problem. Under the prevailing conditions wherein we have to cover about 10 lakh documents

46

Wall-Less Libraries—in Relation to Resourse Sharing

KALYANI ACCANOOR*

ABSTRACT

Information has been growing at a tremendous rate with no limits of walls or boundaries, especially in the age of WWW. With the financial crunch no library can proclaim to be self sufficient. One has to depend upon other libraries for sharing of resources. With the IT making rapid strides libraries have to adapt themselves in routine work, while maintaining the quality, service and efficiency for their survival.

The article gives an on-the-job experience at Central Library, Indian Institute of Technology, Mumbai. Future trends wherein printed matter will give way to ondemand electronic delivery of documents is also touched upon.

1. INTRODUCTION

In India education is considered as a key infrastructure for economic development in the twenty-first century. Changes in the curriculum and opening of new departments/ interdisciplinary centres has led to the demand of newer resources in various formats along with the print medium. Information explosion and expansion are other factors that affect the need of more reading material in the academic institutions. These two main factors have influenced Libraries and Information Centres (LICs) to automate their services and share resources through traditional methods and also by networking.

Also, with the fast changing information technology, the rapidly escalating costs of needed resources and the wide disparties in the resources available in India have led to the

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greater need for sharing resources.

Resource Sharing (RS) has become a compulsive feature in academic libraries because of the demand for latest publications mostly foreign journals. RS may appear to be a new term for the familiar concept of library co-operation, it is an important element in the national planning of library and information services to meet the information needs at all levels.

RS in no way does away with the need for building basic collection of materials relevant to the needs of the community served. RS can be more successful when there is a strong collection. It is only possible to share on the basis of reciprocity when participating libraries maintain basic and relevant collections. All these factors have influenced libraries and information centres to automate their services and share resources through networking.

With the diversity of information resources, the traditional role of librarians in Interlibrary Loan (ILL), Document Delivery (DD) and Resource Sharing (RS) has become increasingly complex.

In today's information setting, librarians must search different sources using different interfaces. They must manage customer requirements on different platforms. Customer expectations have risen by Internet activity outside the library walls.

Information technology has brought a fundamental change in the structure and functioning of libraries. They are resorting to faster means of communication such as computer, on-line searching, CD-ROM and computer networks to cope with the tremendous increase in the information and increasing demands of the users.

The changeover from a 'Traditional Library' to an 'Electronic Library' which has no boundary is yet another turning point in the history of librarianship. The current trend is that large amounts of material on shelves awaiting possible use can be easily made available on demand. DDS/ RS have led to use of more materials from libraries. Whereas earlier books / journals were required to be sent to other libraries physically on ILL, the situation has changed drastically with sophisticated phototcopiers, fax and e-mail.

2. PURPOSE AND NEED

With the ever increasing volume of information on the Internet and WWW, it has become a challenge for librarians to locate the correct document at the correct time. The challenge is even greater when it comes to getting a particular document which otherwise is very difficult to reach. How helpful and effective are the modern DDS / RS tools or are traditional methods still better? The scope of the paper, is to delibrate on this important question.

3. WHAT IS RESOURCE SHARING?

- To function the basic services effectively and a well maintained library is a must.
- To share resources of libraries and to disseminate information about new arrivals of books and journals etc.,
- Providing voluntarily and by natural agreement reading material which is beyond the reach of individual libraries.
- To set up information bases to assist the corporate organisations
- Conduct e-seminars, workshops, training programmes.
- Achieve economy in the use of resources both human and material.
- Facilitate sharing of materials among members of the group
- Reduce wasteful duplication of indexing / abstracting of materials.
- Cannot be considered as a service for cutting on costs.
- Access to electronic resources

4. CRITERIA FOR RESOURCE SHARING

- *Geographic proximity* - local, outside city, state, country.
- *Type of Institution* - autonomous, government, special.
- *Size of Institution* - college, university, research.
- *Source of Funding* - local, government, special aid.
- *Size of Budget* - proportionate to the departments .
- *Level of available Technology* - Internet, intranet etc.,

5. INTERNATIONAL SCENARIO

Resource Sharing has gained a lot of momentum in the present scenano. The following are just a few examples of RS and DDS.

5.1. **BLLD** "Expand your mind / Shrink the world" this statement on the BLLD website is very true. All of us are aware of BLLD where one can get photocopies on request against cost which compared to the Indian standards is on the higher side. BLLD operates an extensive international lending and photocopying service for which it makes a charge. This goes to prove that resource sharing is not confined to reciprocal sharing and also that payment basis may supplement sharing of resources. However for many, while obtaining phototcopies at cost from abroad may be affordable, the postal cost of borrowing books from abroad maybe prohibitive.

5.2. **OCLC**.: The Ohio College Library Centre operates a computer network system in which over 2,500 libraries across USA and in other countries participate. Its main objectives are to increase the availability of library resources among users. Requests for loans can be forwarded automatically. It provides a number of other services to the participating libraries.

5.3. **VDX.** : A new software system could bring libraries of the world together in a kind of super-library and would cut through the mountain of paperwork currently required for ILL work. This system, UK based Fretwell - Downing informatics is entitled VDX. The system taps the WWW and enables end-users to submit requests electronically to supplier libraries. VDX caters to a number of delivery methods such as loans, faxes, photocopies and electronic delivery.

6. INDIAN SCENARIO

6.1. **INSDOC**

INSDOC services are well known. They procure and supply rial from other libraries and NUCSSI catalogue helps ating many journals though it is not known whether all the libraries entertain requests for ILL / RS.

6.2. Globe Publishing Agency

This agency has recently started a service about holding duplicate issues of journals which is posted on their website at http://www.globepub. In this one can locate journals required by them to complete their volumes and also by registering with them can host their duplicate issues. The required issues hoewever, can be obtained at cost.

6.3. Libraries and Information Network

Recognising the importance and need for the optimum utilisation of available resources several libraries and information networks have been developed in different parts of India since 1988.

There are a number of networks in India. Few networks are still undeveloped and existing networks have to be interconnected to achieve the desired aims. Indian libraries are progressing to match the automated libraries in the developed countries through the application of information technology, indigenous softwares, and the local expertise. It is quite heartening to know that most of these networks have a number of features to help in RS / DDS / ILL

Some of the Networks are :

- Information and Library Network (INFLIBNET);
- Delhi Library Network (DELNET);
- Scientific and Industrial Research Network (SIRNET);
- Calcutta Library Network (CALIBNET);
- Madras Library Network (MALIBNET);
- Bombay Library Network (BONET);
- Mysore Library Network (MYLIBNET); and
- Pune Library Network (PUNENET).

7. ON-THE- JOB EXPERIENCE AT I.I.T. MUMBAI CENTRAL LIBRARY

7.1 ILL / DDS / RS Services

- **Inter-library loan** : Books, conference proceedings, bound volumes, reports etc., are given on loan to libraries in Mumbai for a limited period on reciprocal basis.

- **Document Delivery Service** : Photocopies of articles from journals are given at cost to

i. Our students

ii. Students from educational institutes who are members of our library.

iii. Corporate members.

iv. Against deposit account. This scheme was started some years ago and is working well. Some organisations which want the material and are unable to visit the library have opened a deposit account with a minimum of Rs.1,000/- As and when the requests come from them photocopies are sent with the amount deducted from their deposit and a bill accompanies their copies.When the deposit reaches Rs. 500/- a reminder is sent to renew the deposit.

v. In urgent cases photocopies are sent by fax.

vi. FFF Free Faculty Facility: Started in 1998 this is a facility given to the faculty to avail 100 copies a month and has to be selfoperated. A dedicated photocopier machine is available for them.

vii. Photocopies of articles are sent to other libraries on reciprocal basis also.

viii. Database of photocopies procured from other libraries is available for consulting and also for retrieving.

7.2 Resource Sharing

Being an open access library the holdings are open to the faculty,students and also to the members of the library such as local colleges, corporate organisations,etc., thus adding value to the library services.

A list of duplicate issues is sent to major academic libraries and wherever requested duplicate cop' 's are sent. Content pages of journals are sent to libraries wherever requested. To aid in resource sharing catalogue of periodicals is brought out every year and a copy is sent to major libraries. Besides, the catalogue of the library holdings is available on the website at http:// www.library.iitb.ac.in

8. TECHNOLOGICAL DEVELOPMENTS

As digitisation is making progress in many libraries one can expect to see documents in digitised format which can be easily transmitted. Photocopier machines have been making tremendous progress such as M/s.Godrej-GE Appliances, who are bringing out copier, scanner and fax machine all in one. These developments will definetly help in sending and procuring documents faster for RS and DDS.

9. SUGG STIONS /BENEFITS

- A depositary of duplicate issues needs to be built.
- A database of this collection and constant updating.
- Online requisition forms to be made available.
- Timely circulars to be sent to all libraries wishing to participate .
- Give duplicates on first come first served basis.
- Could serve as an exchange library *i.e.*, give and take basis.
- Need for standardisation.
- Unnecessary duplication of expensive resources such as literature based CD-ROMs should be avoided thus preventing additional finance which could be used to procure some other resources.
- Users of existing services should have access to a wider range of materials, collections and services.

10. CHALLENGES

However, Library and Information Centres (LIC) need to have a clear vision about the role they have in the information society. Just as electronic books are replacing physical books, the traditional LICs are undergoing transformation in size, location, operation and shape as they become fully electronic.

Some of the challenges are :

- active and vigorous promotion of resource sharing among the member LICs;
- the development of a network of LICs;

- the collection, storage and dissemination of information;
- the availability of computerised services to users;
- the coordination and cooperation for suitable collection development, reducing unnecessary duplication wherever possible.
- human expertise and skills in not only being able to locate the required document but also be able to download or procure in print as an information provider.

11. CONCLUSION

Allen Kent in his book says *"In the history of Inter Library loan, Alexandria library loaned books to Library at Pergamum around 200 BC"*. ILL, RS has existed even as far back as 200 BC. Various developments taking place in the current library scene and the demand for instant information has led to instability, unpredictability and has left many a librarian in state of dilemma. What to procure or where to search is a constant query.

Thus, librarians should have greater will power and urge to share their resources. Without the required tools it becomes difficult in locating any resources. This, however, does not mean that information professionals should stop planning their libraries / information centres. It is necessary that they adapt and adopt to changes in their routine working. This calls for leadership and vision apart from commitment and dedication on the part of the information professional concerned. With the arrival of electronic information sources / services / network systems on the library scene, especially the Internet- the need for formulation of a strategic plan where the emphasis should be on access to information rather than on ownership has become even greater.

In this context, one should exploit the sources on the Internet to the maximum extent possible for achieving the objectives / goals of the library. For this purpose it becomes essential to educate and train available manpower with the latest developments. Regular training is required for the users to acquaint them with the IT related resources.

To conclude, libraries and librarians should consider **Internet-based collection development and Internet-based services**

especially with context of dwindling financial resources and growing demands of the user community.This will augment the traditional services like ILL, DDS, and RS. Personal skills in keeping contact and cordial relations with other libraries are most essential to foster excellent library practices for quality, impact and survival.

Thus wall -less libraries will come into existence if the willingness to share is in the minds of librarians and information professionals.

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47

Are We Moving to The Paperless Society?

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ABSTRACT

The terms 'paperless society' is a broad concept. It includes 'paperless office' or 'paperless information systems' or both. The present day office is said to be an Information Processing Center, whereas the present day library and information centres (LICs) are different category of Information Institutions whose several functions are more than office functions as these serve the large part of the society. This paper discusses about the important and salient traits of newly emerged IT that makes necessity for automation in LICs, Internet service, COM/CAR and Microforms. Integrated Office or Library Automation, Changing scenario of LICs, Views have been expressed by authors and commentators on the impact of print and electronic media, the role of librarians, Indian information scenario and role of paper print media in 21st century.

1. INTRODUCTION

Are we moving to the paperless society? Or paperless information systems? Will the computers make the traditional libraries obsolete? Will libraries survive? End of libraries, electronic libraries, digital libraries, virtual libraries etc. These are some of the titles of articles and books appearing since two decades in journals and books of Library and Information Science, information

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technology and computer science.

2. THE CONCEPT

The terms 'paperless society' is a broad concept. It includes either 'paperless office' or 'paperless information systems' or both. 'Paperless office' here means functioning of office without the use of the paper. The concept of office has been changing from time to time. In usual terms an office is a workplace to meet out the requirements in order to attain a goal for a specific purpose. Office is a new concept in the world. The present day office is said to be an Information Processing Centre with these activities: 'Information flows in; information gets stored and retrieved; information gets amended/updated and reformatted with other information; and information gets distributed and used'[1]. The present day library and information centres (LICs) are different category of information institutions whose various functions are more than office functions as these serve larger part of the society. These include Libraries, Information Centres, Documentation Centres, Information Analysis Centres, Data Centres, Referral Centres, Clearing houses etc. Libraries—public, academic, government and special—provide the only means of access in our society to any book, journal, or document that is out of print or more than a few years old. Information centres give information that is inside the document and also processes and disseminate it. Documentation centres are basically for specialist users in the field. Information analysis centres not only disseminate and retrieve information but also create new information. Data centres collect, control, codify, organise and retrieve the data for the users. Referral centres are directional source, these provide mechanism for switching to information sources. Clearing houses collect, maintain records of research, development and other activities being planned, currently in progress or completed.

In all the above, the basic elements include: manpower, machines, paper, records, documents, files and procedures.

3. NECESSITY OF I.T. FOR AUTOMATION

Information Technology (IT) resulted from the integration or convergence of two technologies, *i.e.*, (1) Informatics (Computer technology and its applications) and (2) Telecommunications. Informatics gives the capability to capture, retain, manipulate,

search, retrieve, present and package vast quantities of information to suit the exact requirements of the end user. Telecommunication technology enables delivery, dissemination and exchange of this information in an electronic form, either locally, regionally or globally. In other words, Information technology is a cluster of technologies that provide automated capabilities for (*i*) Data collection (*ii*) Data input (*iii*) Information Storage and retrieval (*iv*) Information processing (*v*) Information presentation and (*vi*) Communication.

The important and salient traits of newly emerged IT that makes necessity for automation in LICs are as follows:

i. Increased computer power leading to speedier and cheaper computer processing.

ii. Cheaper data storage, *e.g.*, Optical storage media.

iii. Digitization of information - text, graphics, photographs, speech, sound, video etc.

iv. Better data transfer between different systems and media.

v. Improved telecommunications such as ISDN, with increased capacity for data transmission.

vi. Decreased size of equipment.

vii. Increased reliability of hardware and software to perform repetitive and routine jobs.

viii. Wider online availability of book vendors, publishers, book/ document selection tools, source materials to facilitate computer-based acquisitions.

All the above have led to the development of international, national and local online systems:

- Automated library systems
- Online public access catalogues (OPACs)
- Electronic journal, electronic knowledge banks and expert systems.
- CD-ROMs and several other compatible devices.

4. INTERNET SERVICE

Internet is a network of networks which has facilitated easiest access from one corner of the world to the user at his workplace

within no time. It serves the multiple needs of every individual by collecting the information from the world wide web (WWW).

Internet services include e-mail, Gopher, FTP, Socks, Http, Secure, Telnet, and Usenet news group but by far the most popular is the World Wide Web. The web is a series of interconnected documents stored on a computer somewhere called a site or website.

5. COM/CAR AND MICROFORMS

Interfacing of micrographics with other technologies is of more recent origin. Because of high speeds at which computers could deliver processed data and vast quantities of information computers could generate, COM (Computer output on microfilm) offers an economic alternative to paper work. Hardware and microforms were developed to make micropublishing a practical reality. COM devices are now available that utilise dry film and laser technology. These COM systems can operate on or offline with host computer and have high speed dry non-impact printing capability on films. The output can be microfiche or 16 mm roll film at a speed of upto 10,000 pages an hour.

Combining data processing technology with micrographic technology to create computerised indexes for fast and efficient retrieval of information on microforms is known as Computer Assisted Retrieval or CAR. CAR can be employed in a variety of configurations, databases and applications. It serves all types of microforms both roll film and various unitised formats (microfiche, jackets). It can be used in conjunction with manual, semi-automated and fully automated storage and retrieval devices.

The types of microforms include (*i*) Roll film, (*ii*) Micro card (*iii*) Microfiche (*iv*) Ultrafiche (*v*) Aperture cards (*vi*) Ultra chips (*vii*) Chips, and (*viii*) Jackets.

6. INTEGRATED OFFICE OR LIBRARY AUTOMATION

In order to meet the needs of an office, all technological equipments and resources are integrated for automating the office operations. In a typical integrated office automation, the major components are word processing, data processing, image processing, voice processing, e-mail, photo-typesetting, micro graphics etc.

In order to meet the users'. needs quickly and to improve

quality of services it has become a necessity to automate the library housekeeping operations. In an integrated LIC environment the computer-based housekeeping systems include: maintenance of document collection and preparation for its use for browsing, accession, borrowing and returning etc. It involves all the sections of work of collecting, organising and services of library materials. IT has speeded up the accession, processing work by eliminating a large amount of repetitive and time-consuming work. The major components include machine-readable cataloguing, online bibliographic databases, fax, e-mail, online public access catalogues (OPACs), optical discs etc.

7. CHANGING SCENARIO OF LICs

The recent trend of increasing application of the latest developments in the fields of computer, telecommunication, laser, reprographics and micro graphics in information handling is radically changing the information scenario of LICs resulting the birth of Electronic Libraries, Digital Libraries, Virtual Libraries etc.

Paper which has been most extensively used as the carrier medium for information, is being gradually supplanted by 'electronic media', as these media can store very large quantities of information in very compact form and enable much faster retrieval. Besides, the storage cost per unit of information is also far less. Already the vision of 'paperless library' and 'Paperless Information Systems' is being increasingly projected for the last two decades.[2]

Prof. Lancaster[3] of USA and information experts belonging to this school of thought, have even ventured to predict the total demise of paper medium by the end of 20th century. A more rational and balanced view even in respect of the advanced countries like the USA is that the use of paper as print medium will progressively diminish and publications such as abstracting and indexing journals, periodicals, reference publications such as encyclopedias, dictionaries etc., will be in electronic/micro-form media and publications that are usually read in their entirety will continue to be in paper form.

As regards the developing countries, which constitute the majority, the transition from paper to electronic/microform media will be a slow process.

8. VIEWS EXPRESSED BY AUTHORS AND COMMENTATORS ON THE IMPACT OF PRINT AND ELECTRONIC MEDIA

Due to proliferation of books and other documents in a traditional library system it is predicted that in the year 2040, 'the Yale University Library will have 200,000,000 books on 6,000 miles of shelving and that catalogue would comprise 750,000 catalogue drawers occupying 8 acres of floor space and would be serviced by 6000 catalogue staff'.[4]

James Thompson says that the 'The End of Libraries' obviously must have something to do with new technology. He talks about on-line retrieval services, micros, videotex systems, video disk storage and that the information technology era is dawning.

The technological combination of computers, in which information can be stored and processed, and telecommunications, by means of which information can be transmitted to anybody anywhere in the world. 'Libraries need not be visited, card catalogues need not be consulted, shelves need not be searched and books need not be scanned'.[5]

The increasing availability of information through machine-readable form permits many information users to be satisfied by not visiting the libraries and librarians. For example:

i. CD-ROMS allow individuals to own specialised collections of information sources and to carry with them, instead of travelling to conventional libraries to consult them.

ii. electronic journals are less costly to produce and to maintain than the conventional journals.

iii. when connected to networks, the PCs that many people own can function as workstations, bringing an unprecedented richness of information resources to their desktops.

iv. It is ironic that the new information services simultaneously increase user need for the assistance of information specialists and reduce the contact they have with them. Users will be more likely to seek advice from colleagues or technical specialists than from Librarians and Information Specialists.[6]

With reduced importance of physical libraries, librarians and information specialists will need to function more like 'consulting information engineers' than traditional, passive information resource custodians and dispensers of documents.

9. ROLE OF LIBRARIANS

The views expressed by Patricia, President of the American Librarian Association[7] and her arguments about the active role of librarians are just enough to strengthen the very existence of professional librarians.

She speaks of two major assumptions. The first is that we are moving towards a paperless society. Books will soon be historic artefacts and full-text electronic publishing will hold sway. The second assumption that hardware and software will be readily available, usable, affordable, desirable and satisfying to everyone.

No machine can compete with a creative, knowledgeable, flexible professional librarian, who provides interpersonal interaction, information evaluation, communication, synthesis and judgment.

The role of librarian is to distinguish between data and information, between facts and knowledge. Libraries must be concerned not only with the 'what' and the 'how' but with the 'why'. Our challenge is not just to provide more information, or even the right answers. Our challenge is to help people to formulate the right questions.

In view of the above, the present day professional librarians need to change according to the changing environments and improve skills and to know how to compete with the fast growing technological revolutions.

10. THE INDIAN INFORMATION SCENARIO

The third meeting of the Information Today and Tomorrow[8] organised under the aegis of NISSAT by the NIC on Chemicals and Chemical Technology (NICHEM) from 7-10 January, 1997 held at NCL Pune, was marked by active interaction between the information experts and users of Infotech. The seminar was attended by 200 or more participants, representing Government departments, universities, IITs, research institutions, private sector and freelancer.

The session was divided into six technical sessions: *i*) Emerging trend in Information Technology *ii*) Internet *iii*) Internet publishing *iv*) Information Resources *v*) CD-ROM Technologies and *vi*) Impact of Technology on Libraries

In the 3rd technical session, the first presentation was by Mr.

H.R. Mohan of *The Hindu*, Madras, entitled "Internet Publishing: The Hindu Experience", Giving a brief background of *The Hindu*, he pointed out the advantages of going for electronic publishing. He informed that by doing so, they could turn the national daily into a global media covering the news of the home country to NRIs and Indian students abroad.

In the Sixth technical session, the first presentation was on "Towards a Digital Library" by Prof. N.Balakrishnan, IISc., Bangalore, giving a glimpse about the future of the libraries. He said that the whole structure of information technology will change with synergy between computer and communication on one hand and creators, publishers and distributors of information on the other. He projected that in future we shall have global libraries through which information could be accessed and delivered to users at distant places. The users would not be required to go to libraries as is the practice today. Libraries will not have big buildings, no updating or weeding of books. They will be known not by number of books they hold.

The second presentation was on "Changing face of Library Automation" by Mr.T.S.Ramakrishnan, APTECH-CBT, Bombay. He mentioned that while there is transparency with wide variety of media, today it is possible to have local and wide area search of information and its retrieval with interactive facilities. The global library catalogues are now open to users, for searching information with tremendous speed, at less cost, and round the clock.

In view of the above situation it is the duty of present day librarians in India to equip themselves with computer skills due to the impact of electronic media and improve the quality of services to survive in the new millennium.

11. ROLE OF PAPER IN 21ST CENTURY

Paper as print media has revolutionised the world over five centuries. Right from the Gutenburg's invention of the printing press, the printed world has captured the civilisations of the world. Paper is the cheapest means of mass communication media, which carried the printed word to millions and millions of people throughout the world over the centuries. Paper has become essential commodity in the lives of people of all walks of life. Paper is extensively used in education, training, teaching, learning, research in government office and industry. Even in 21st century

the use of paper has not yet been diminished or reduced. For example, certificates are still being issued in paper form for various degrees, awards, merits, talents, standards in almost all the fields including games and sports. The currency in paper form is still used in almost all the countries of world.

Newspapers, magazines and books have become familiar in every part of the world as representations of print media. Newspapers intended to disseminate the news of the day as also day-to-day events that take place in different parts of the country or the world as a whole. According to the latest Annual Report-2001 of the Registrar of the Newspapers of India (RNI)[9] newspapers and periodicals registered showed a 5.34 per cent growth in the country last year. The number of registered publications rose by 2,502 from 46,665 in 1999 to 49,145 in 2000 whereas the circulation of publications went down by 2.4 per cent.

12. CONCLUSION

In view of the above situation, the questions are—Are we moving to 'paperless society' or 'paperless information systems'? In answer, to the question we can certainly say that we are moving towards 'paperless information systems' for speedy access to information, processing, storage, retrieval, communication and information generation but in no way this would entirely or totally substitute the paper print media. Certainly, we minimise the use of the paper print media to some extent due to the impact of electronic media. Even then, we still require paper print media for authenticity of the information, mental make-up, decision-making and for extending our thoughts, ideas, feelings and expressions etc.

As a matter of fact, the creator of any innovative idea would like to see his creation in print. Nothing gives more satisfaction than to see his thoughts in print. Further, inspite of many means of communication, only printed word carries authenticity. It is quite likely that what is printed could become less and less due to increased cost of production, but will never a 'paperless society'. Therefore, it can be concluded that 'both books and electronic documents are going to stay side by side [for some more time] and each has a definite role to play in information communication'.[10]

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48

Building up of Serials database in an University Library: A Case Study of Indira Gandhi Memorial Library, University of Hyderabad.

V UMA*

ABSTRACT

This paper discusses the serials control system. Serials processing of the Indira Gandhi Memorial Library (IGM) in the light of automation is highlighted while discussing the various functions related to the serial system. The available automated options which facilitates quick and easy operations are mentioned. The acquisition and accessioning of back volumes in an automated environment are also discussed .

1. INTRODUCTION

Attempts to automate libraries started in the last 10 to 15 years but it is only during the past 7 to 8 years that the University Libraries have became more concerned about automating their operations or services. The areas of automation include Circulation, Acquisition, Serials Controls, Catalogues, Documentation Lists, Management, Bibliographies, Databases, Budgeting, Information, Retrieval etc.,.

1.1 Automation of Libraries

Fiftyfour Universities were funded till March 1995 under the INFLIBNET programme of the UGC and some more during 1996-1997. During the 9th plan period under the INFLIBNET Programme of the UGC, it was decided to automate hundred more University libraries.

1.2 Library software package

The availability of some library application software packages in

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India such as CDs/ISIS (UNESCO) LIBSYS (INFOTECH), LIBRARY MANAGER (SDC) WILISYS (WIPRO) helped in the development of library automation.

2. DEFINITION

A serial may be defined as any publication issued in successive parts, appearing usually at regular intervals, and as a rule intended to be continued indefinitely. The term, includes periodicals, newspapers, annuals, numbered monographes and the proceedings, transactions and memories of societies.

3. WORKFLOW IN THE SERIALS SECTION OF ANY UNIVERSITY LIBRARY

Serials play an important role in University Libraries as they provide the current information and cater to the current information needs of the faculty members, research scholars and the post-graduate students. The following are some of the important operations to handle the workflow in the serial section.

(*i*) Budget allocation

(*ii*) Receiving recommendations or indents from the faculty members / Head / Deans etc

(*iii*) Placing before the Library committee for its approval

(*iv*) Sending letters to the departments that the serials recommended are approved and are to be ordered.

(*v*) Placing orders for the subscription of serials directly with the publisher or through the agents

(*vi*) Making advance payments

(*vii*) Receiving the invoices and forwarding them for payment with other supporting documents

(*viii*) Receiving the issues and posting them

(*ix*) Maintaining the expenditure analysis

(*x*) Sending reminders for the unsupplied journals or overdue journals.

4.VARIOUS FUNCTIONS RELATED TO THE SERIALS SYSTEMS

(*i*) New Subscription

(*ii*) Subscription renewal

(*iii*) Invoice Processing

(*iv*) Receipt of periodicals

(*v*) Monitoring claims

(*vi*) Bindery Management

(*vii*) Circulation

5. AUTOMATION OF SERIALS SECTION -INDIRA GANDHI MEMORIAL LIBRARY (IGM)

The automation was initiated in the year 1989 with dbase records. In the year 1994 with the one-time, one crore grant from the UGC the IGM library was able to comfortably go ahead with automation. The IGM Library has a collection of nearly 1,98,820 books, 709 current serials, 68,900 back issues of serials, 50 popular magazines apart from SC/ST collection and Theses / Dissertations. The IGM Library is included in the INFLIBNET programme of UGC and it has Internet connection with which it can access the INFLIBNET database.

The automation of book acquisition started in 1992. Serials automation was initiated in the year 1995 followed by bound volumes in the year 1997. It spends nearly Rs one crore and ten lakhs, towards subscription of 709 current serials. Further recently it has subscribed to EBSCO journals covering areas of Social. Sciences.,Humanities,Management Sciences &Generalia. Campus-wide local area network is provided for accessing the EBSCO journals.

5.1 The LIBSYS and the Serials Menu

The serials module has four sub-modules to execute various functions related to serials control.

5.1.1 Subscription

This sub-module deals with new subscriptions, renewed subscriptions by going through the approval process or directly entering the approved titles for ordering, skipping the approval process. The new and renewed subscription both can go through approval process or directly go for ordering. There is a provision to recall last year's serials for renewal of subscription which facilitates easy and quick operations. Next step is ordering the approved titles and updating subscription details followed by invoicing. This is followed by registration of new issues, additional

issues annual volumes, special issues, claims monitoring, binding / BV's collection.

5.1.2 Miscellaneous

This has facility for Articles indexing, Record keeping, Enquiries, Reports generation, system set up, System options, House Keeping, Stock Verification.

5.1.3 Circulation

It deals with check in and check out functions.

5.2 Serials Database Creation

Certain directories were created through the record keeping module which facilitated to tap the serials module. Initially the following codes which were created helped us in entering the current data and also brought uniformity and standardisation of both Acquisition and Serial Records.

5.2.1 Vendor Directory

Vendors with whom orders are to be placed were identified, they were coded and directory created with their addresses and phone numbers:

Vendor	Code
M/s Applied Publishers Subscription Agency	APS
M/s India Book House Subscription Agency	IBH
M/s. Higgin Bothams Limited	HIG

5.2.2. Currency Directory

Different currencies pertaining to different countries were coded and updating the conversion rates as per the RBI rates was possible.

Currency	Code
Australian Dollar	A $
Indian Rupees	IRS
US Dollar	$

5.2.3 Budget Head

Different Schools / Departments were identified and thus coded Alpha / Numerically to facilitate budget allocation.

Budget Head	Code
Physics Periodical Grant	P6
Chemistry Periodical Grant	C6
Mathematics Periodical Grant	M6
Physics Periodical SAP Grant	P8
Chemistry Periodicals SAP Grant	C8

5.2.4 Languages

Languages were coded by taking the first alphabet for recording different languages:

Languages	Code
Russian	R
French	F
English	E

5.2.5 Periodicity

Periodicity of the Periodical was again coded with the first alphabet.

Periodicity	Code
Quarterly	Q
Monthly	M
Weekly	W

Text, notices are formatted for order forms, approval forms, reminders etc. and thus reports are generated and sent to the concerned person. This function enabled us to correspond with the Vendors.

5.3 Serial Subscription

5.3.1 Current Data Input

It starts with the 'Enter Title' function by entering new titles, requesting for a specimen copy from the vendor and going through the approval process through the approval number. This enables to list out all the titles to be included in the approval list, generating reports and sending it to the departments for approval. Subscription details of a serial such as publisher, country of publication, delivery mode - Airmail / Surface mail. Volumes / Issues per year, subscription year, Subscription mode whether

direct or through vendor, date of first issue, in transit period, Budget Head etc., can be entered while performing the 'approval process' or 'ordering'. After getting the recommendations from the department, the approval list is updated. Titles can be included or rejected at this stage through the Add / Remove options. Updated subscription details is possible in two ways. The select option involves displaying the existing subscription details of each serial one by one and updating those for which modifications are necessary. The 'Enter Title' option involves selecting by entering its alpha code or title or ISSN as per the procedure. When the new title is entered the system automatically draws the first letter of every word of the title to form the alpha code.

5.3.2 Ordering

Placing orders for the titles so approved or renewed through the order I.D. which is system generated can also be user defined. Orders are placed through the agents by including the titles in the order list using the add function through the alpha code or title string. There is a provision to add or remove titles from the particular order by typing 'Y' against the serial to be included in the order, and using the delete function by typing 'Y' against those serials to be deleted. The deleted serials are available for inclusion in other orders. Thus the order gets placed with the particular vendor by entering the fields of the new order such as vendor code, type of order, date of order, subscription year, Budget Year etc., Updating the subscription details can be done by using the 'Update' option to change the details such as the order type, the order date and the vendor. Orders get processed by using the ' process' function. Once the orders gets processed the purchase order may be printed through the 'Reports' function and sent to the vendor. "Quit" option allows selection of another order. Current status of the new serials can be known by highlighting the serial from the list and pressing the entry key to see the details whether:

- Initiated
- Sent for approval
- Approved / Rejected
- Ordered
- Invoiced

- Paid for
- Received

The procedures are the same for New / Renewed subscriptions.

5.3.3 Invoicing

The invoices received from vendors are recorded by entering the details such as invoice numbers, date, net amount, and the corresponding order. I.D. after which each title in the invoice can be chosen for billing using the 'Enter Title' option and typing the alpha code or title or ISSN. While invoicing a serial details such as subscription, discount, exchange rate etc., may be amended. More than one invoice for one order is permitted. The original invoice is typed 'O' and the supplementary invoice is typed 'S'.

Once an invoice is selected new or old the following options are available:

(*i*) Billing

(*ii*) Modify

(*iii*) Update subscription details

(*iv*) List details

(*v*) Update Invoice details

(*vi*) Quit

• Billing

To select a serial billed in a specified invoice either 'Enter Title' or select title from the list may be chosen. The Select Option is used only for original invoice. The 'Enter' serial option is applicable to both original and supplementary invoices. It involves selecting the invoiced serial by entering either alpha code or title or ISSN. There is a provision to enter subscription number for an original invoice.

• Modify

To remove a serial from the current invoice the subscription amount is changed to 'zero'. While removing a serial care must be taken to see that the serial doesn't appear in supplementary invoices.

• **Update Subscription details**

This is done using either 'Select or 'Enter' Option. By doing so current subscription details of each serial in the invoice is displayed and the one which has to be updated can be selected.

• **List of Details**

Details of the serial can be known.

• **Update Invoice Details**

This is used to change the details such as invoice number, date, amount etc.

• **Quit**

This allows to enter a new invoice. For each title the gross amount, the conversion rate and the percentage of discount when entered, the computer computes the conversion and discount rates which saves us from the manual calculations. Finally when the last title in the invoice is billed, the final amount matches with the net amount entered at the time of entering the invoice details. This enables one to know that the invoice is rightly entered.

5.3.4 Payment Request (REP)

This function is operated through the payment request number which is system generated. (can also be user defined). When the payment request number is keyed in all the invoices appear on the screen and thus the invoices that are to be included for payment are added under the particular request number, by saying

"Y" (Yes) against those invoices and processing it using the processing function. This request for payment involves preparing the requisition list for getting sanctions from the concerned department and payment from the account section. Here the options such as add, delete, list, update requisition details etc., are available.

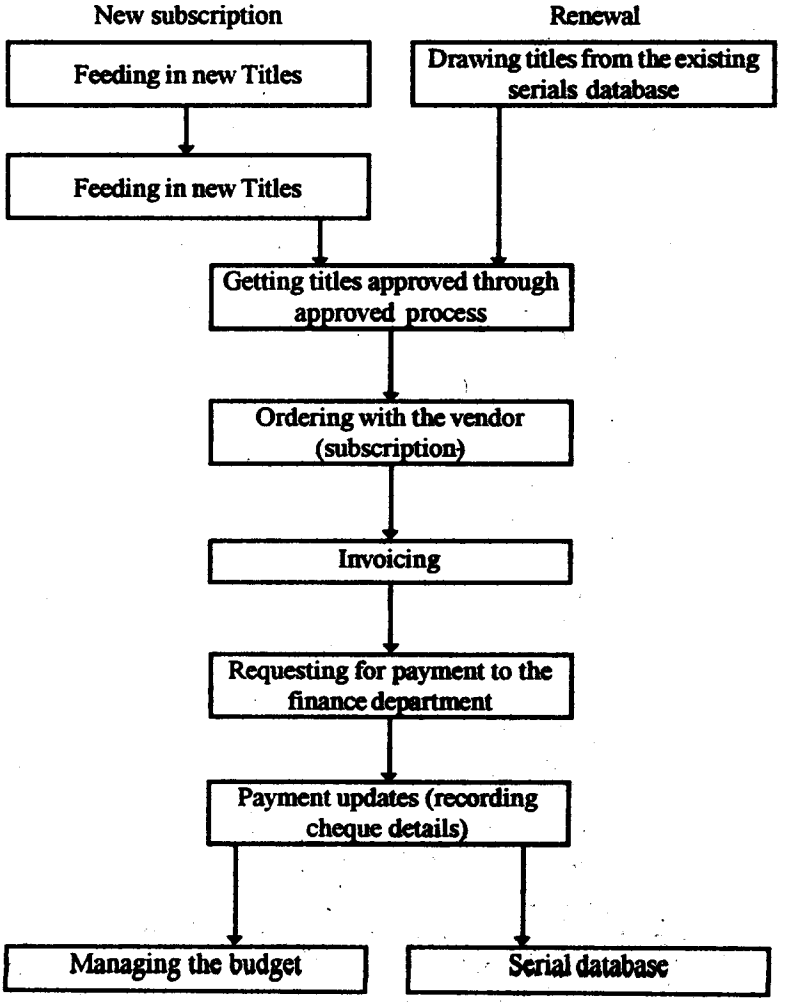
5.3.5 Payment Updates

Payment details are posted against the corresponding vendor and invoice after each is processed by the Accounts section. The payment requisition number may be entered and once the RFP is selected, it lists out the vendors whose invoices it includes. Payment details such as, cheque Number, cheque date and bank drawn on may be filled in.These details when entered and

processed helps us to know the balance amount in each department thus maintaining the expenditure analysis. The vendor can also be notified by sending the cheque delivery notice through reports generation function. Here the titles in the invoice get paid status.

FIGURE 1

Serials subscription (ordering & invoicing)



5.4 Receipts Control

5.4.1 Registering New Issues

The new issues of serial received against the orders so placed are entered here using the alpha code or title or ISSN. After selecting the serial, the system accepts the volume / issue number and date besides other optimal details. If the date of periodical is not entered, the same is computerized on the basis of frequency of the serial. Here options like modify, quit and process are available to change the data entered, and to update the holdings of the serial. Once the serial is selected, receipt of any number of issues may be recorded. Though the message "Duplicate issue" is flashed the system permits duplicate issues to be received if necessary. The recording of their receipt enables one to generate the duplicate issues list. If the issue is damaged it is so noted here. This sub module helps us in building up the database of loose issues of serials.If there occurs any change in the periodicity the same can be updated using "Update Subscription details" function .

5.4.2 Monitoring Claims

The monitoring of each issue to be received as per the respective frequency of the subscribed serial, involves basically generating notices which could be mailed directly to the vendor or publishers.

The purpose is to notify the non-arrival, overdue arrival, or the soiled / damaged copy received of the serial. In the schedule updates functions the periodicity is automatically timed in the system if the first issue is recorded including the transit time for the first issue. Normally, the transit period timed for foreign serials are 45 days and for local serials 15 days.

Modify option allows to make changes in the schedule of issues already entered of the serial. For example, a Serial publishing combined issues in April / May and October / November may decide to change its schedule and publish February / March and August / September as combined issues. Changes in the revised schedule can be entered and deleted, by entering 'Y' against the same in the mentioned column and delete the same.

On selection of the option 'generate reminders' the system asks for the subscription year for which reminders are to be generated. On entering the subscription year, the system identifies the over due missing / damaged issue for the current holdings of the each serial and develops the reminders to be sent to each

vendor / publisher for the specified subscription year. The reminders can be generated through the enquiries or reports function.

The option 'list reminders by title' prints the reminders that have been generated for the individual issues of journal.

'Amend Reminders' option can exclude those issues for which reminders need not be sent by typing 'Y' against those issues and entering it. Modify option allows to make change in the entry.

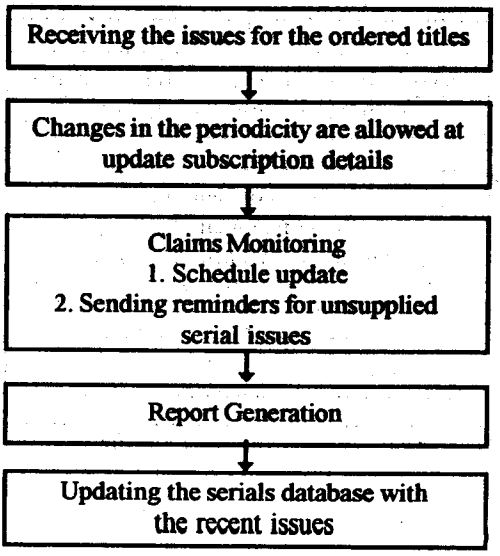
'Reminders by Vendors' allows to print the details of serial issues for which reminders are to be sent to each vendor or the publisher.

'Reminder Notice' prints the reminder notices for direct mailing to the Vendors or Publishers. The reminders can be generated through the enquiries or reports function.

Display Reminders list all the overdue / not received periodicals. The system asks one to specify vendor ID and lists out the reminders that have been sent to the Vendor for missing / overdue / replacement issues of each serial. The reminders can be generated through the enquiries or reports function.

Figure - 2

Receipts Control



5.5 Acquisition of Back Volumes

5.5.1 Binding of the back Issues

In the IGM Library, the back issues are acquired,

(*i*) through the publisher or through the agents

(*ii*) by binding loose issues of serials

(*iii*)by gratis

5.5.2 Bindery Updates

The bindery modules starts with bindery updates in which few issues of serials are combined into one whole volume for binding. This is done through the add option. Selection of serial can be done through the alpha code or title or ISSN. On selection of the serial details of volume to be bound are entered. Modify, Quit, Process options are available. Bindery numbers are generated for each combined issues of serial.

Delete option is used to delete a record from the bindery list through binding control number.

5.5.2 Bindery order

Contract binders do the job of binding the loose issues, and thus orders are placed with the binder. The binder with whom the order is placed is also coded through the Record Keeping Module. The bindery order is used to generate the order for binding, from the records of the completed volumes. On selection of this function, the system asks for the bindery order number. When a new order is initiated, the system asks for a binder ID., the dates when sent for binding, data of return from binding. When these details are entered, a new order is generated. The following options are available.

- ADD - to include more volumes
- DELETE - to delete any volumes in the order
- LIST - to list alphabetically the serials included in the order
- UPDATE ORDER - To modify data such as order date, Binder ID etc
- PROCESS - to complete the bindery order
- QUIT - to select another bindery order

5.5.4 Bindery to collection

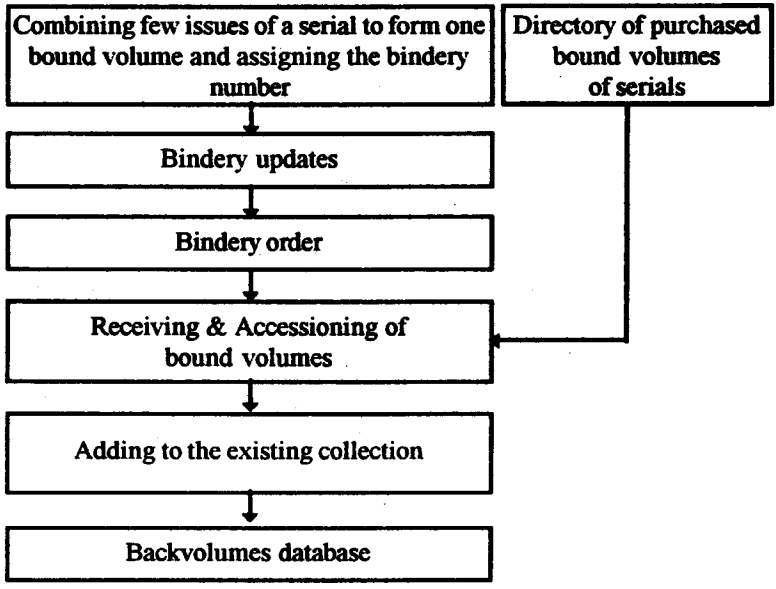
The receipt of the bound volumes are recorded here so as to update the holdings of the serial. On selection of this function, the system accepts the Binding Control Number of each volume. After entering the same, the system accepts further details to be added about the bound volume, *i.e.* accessioning the bound volumes which gets added to the existing collection.

5.5.5 Accessioning of back volumes

This function deals with recording the existing bound volumes already in collection. Accessioning back volumes is also done here directly which are received by way of gift or purchase. Price details are keyed in. There is a facility to view the list of bound volumes before adding them to the database. There are also options available to see the new issues of a selected serial, the accessioned bound volume that do not have to go to the bindery. Modification of the accession number can be done in the case of any mistake. Updating the status of the back volumes such as 'on display' shelf / or reference is possible.

FIGURE 3

Back Volumes Systems



5.6 Circulation

The following functions are available in this sub-module.

- Members Record Maintenance
- Check Out
- Check in

There is a provision for issue ana return of serials through the check out and check in functions. The check out function is used to record serial issued to a member. On using this function, the system asks for member ID, which may either be entered or scanned by bar code reader. Once the member has selected as many periodicals as are permitted or may be issued to the person, the due date for return of the checked out item is compared by the system as per the set up in the system. This date may however be changed prior to check out.

Check in function is used to record the serials returned by a borrower. Member ID may be entered or read by a code reader from the membership card according to the setup of installation.

As per the policy decision of IGM Library the serial issues are not for circulation and hence the non-issue of the same.

5.7 Enquiries

Main enquiries to title based, vendor based, expenditure analysis, order ID., budget heads etc., are known, through this function.

5.8 Reports

Serial based reports generated are lists by title, lists of current serials, serials listing by publisher, list of duplicate issues, list of special issues, list of missing / overdue issues. List notices can be generated on approval list, subscription order list, request for payment, cheque delivery notice, bindery order etc. Other miscellaneous reports related to serials such as, Vendor director, invoice and Bindery Register, Subscribed serials, Supply order, new serials etc., can be generated.

6. CONCLUSION

The automation has facilitated the IGM Library for quick and up-to-dated maintenance of records, easy calculations, maintaining the budget, to keep track of the unspent amount, know the status of the serials / books etc. which has improved the users' services.

Now the faculty members or students can have the access to the holdings of the library through the system in their department. On a trial basis, even the scanning of the contents pages of the journal through the flatbed scanners as and when the new issues of the serials are received in the library, storing them in the system and accessing it by the net work and OPAC users, is a recent achievement.

The automated serials control no doubt has facilitated new / renewed subscriptions easily and quick but the recording of advanced payments, postal charges are still a handicap as the serials control module lacks this facility. We hope that the new versions will fulfil the requirements.

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49

Rental Textbook Service as a Model for Resource Sharing : A Case Study of Pantnagar University Library

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ABSTRACT

The paper gives the historical development of Rental Textbook system and its collection at Pantnagar University Library and discusses manual *vis-a-vis* WINISIS based system for requirement analysis of textbooks. Time, money and manpower reduction is possible through WINISIS based system. The study covers last ten years data analysis. Recommends this system can be followed elsewhere.

1. INTRODUCTION

G. B. Pant University of Agriculture and Technology has the privilege of being the first agricultural university in the country since 1960. From its very inception, the university library has been serving to the students, teachers, research workers and extension specialists. Academic programme of the university is based on semester system. Now there are two semesters in an academic year from the year 1985-86, but earlier there used to be trimesters in a year.

Presently the library has about 3.5 lakh research publications covering a vast range of human intellectual endeavour in agricultural sciences and technology such as: Agriculture, Veterinary Science, Animal Husbandry, Home Science, Fisheries, Basic Sciences and Humanities and Technology. It has different types of collection *i.e.* books, periodicals, serial publications,

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monographs, reference material, statistical data publications, report literature, pamphlets, films, microfilms, maps, slides, photocopies, and theses etc. The collection of the library has been growing at an average rate of about 3000 volumes per year. University library has entered in the era of information technology, using computers and telecommunication technology for information storage and retrieval. The library is presently using CDS/ISIS and WINISIS software package for creating following databases.

(*i*) Books Database : Documents received in the library from January 2000 onwards.

(*ii*) Theses Database : M.Sc. and Ph.D. Thesis submitted in the University from 1960 till date.

(*iii*)IAI Database : Indian Agriculture Index : Bi monthly indexing journal, based on Indian agricultural journals received in the library from January 2000 onwards .

(*iv*) Rental Textbooks Database : Including all the books of rental section and book bank.

Cataloguing operations are completely computerised and catalogue cards are produced with the help of computers. Many other databases like reprints, reference collection etc. are also in progress. Library conducts computerised literature search for students/faculty members using CD-Net databases. Library is also using e-mail and Internet facilities. Among the library services rental textbook scheme is very popular and useful for the students.

2. RENTAL TEXTBOOK SCHEME

Students are usually allowed to borrow textbooks and other reading material for a fortnight and in this short period student cannot read or copy the whole book or required material. At the time of examination students are in need of prescribed textbooks till their examination are finished. The rental and book bank schemes were started with the purpose of making textbooks available to students for meeting their genuine requirements. In this scheme prescribed text books are kept in the rental section and issued to the students for the whole semester @ Rs. 10 per book per semester.

Rental textbook scheme was started in 1964-65 at the university library with the help of USAID grants. Initially,in

1964-65, the total number of volumes in this collection was 2680 purchased at a total cost of $ 29,036.10, equivalent to Rs 1,45,180. The library adopted special set of rules, as approved by the Academic Council for this service. The main features of this service were that a student could obtain copies of prescribed textbooks for the period of one trimester at a time, on payment of 5% of the published price of each volume, borrowed by him. There was no limit on the number of books that a student could barrow at a rent of 5% of the cost of the book. The total amount of 5% of the rental charges received from the students for the volumes borrowed by them was Rs. 1848 during the first year. In July 1979 the rental charges were increased up to Rs 2.00 per book per semester. In January1998 it was further raised to Rs 10.00 per book for a semester. Presently a student can get up to 10 books at a time in the first round of rental issue. There is no limit on the number of books issued to the students after first round subject to the availability of books.

There are seven colleges in the university namely College of Agriculture (AG), College of Veterinary Sciences (VSc), College of Basic Sciences and Humanities (CBSH), College of Technology (CT), College of Fishries Science (CF), College of Home Science (CHSc.) and College of Agri-Business Management (CABM). College of Home Science has a separate library, which is governed by university library. There is a separate rental collection in the Home Science College. College of PGS (Postgraduate Studies) includes PG courses of all the colleges. In CBSH most of the courses are PG. CABM is a new college and its collection of management books is not sizeable. Hence CHSc, CBSH and CAMB are not covered in the study. College of Forestry is located distantly *i.e.* at Ranichori. Forestry students complete only first year of B.F.Sc. from Agriculture College, Pantnagar and then are shifted to Ranichouri campus.

3. RENTAL TEXTBOOK COLLECTION

Presently the rental section has a total collection of 44209 textbooks having 671 unique titles for various colleges. Almost 50 per cent of the titles (338) are for College of Technology 131 for College of Agriculture, 127 for Post Graduate Studies and 72 for College of Veterinary Medicine.

Collection development is not systematic because there is no

fixed amount or budget for this section. Normally the books are purchased from library book grants.

Table-1 : Rental Textbook Collection

Year	No. of volume Added	Total No. of volumes	Expenditure (Rs.)
1964 to 91	38310	38310	-
1991-92	555	38865	70590
1992-93	208	39073	74532
1993-94	241	39314	30350
1994-95	446	39760	138743
1995-96	1451	41211	246481
1996-97	244	41455	173282
1997-98	726	42181	167457
1998-99	642	42822	120320
1999-00	861	43683	220551
2000-01	526	44209	263864

4. RENTAL TEXTBOOK CIRCULATION

The issue and return system of rental textbooks is different from library circulation system. In rental section the books are issued for a whole semester at a rental charge of Rs. 10 per book The overdue charges are Rs 0.25 per book per day. The books are issued on rental cards. Generally rental textbook issue procedure starts immediately after the registration of the students in the university *i.e.* after the first week of July (for Ist semester) and after first week of January (for IInd semester).

4.1 Old system

After registration of the students in university, rental card blanks were used to be distributed to them by Rental Section. Completely filled rental cards, containing details of needful textbooks, the courses offered and instructors recommendation were submitted by the students at rental section within the prescribed time. Cards were collected collegewise on different dates. After receiving all

the rental cards, the library staff used to arrange the cards manually authorwise. Total requirements of all the colleges for rental books were cumulated. After ascertaining the requirements of all the books, it was matched with the number of copies available. If requirement is more than the copies available, then related books were issued on shared basis. Two or three students according to requirements used to share one book. After completing this job, all the cards again re-arrange ID (Identification number) wise for the purpose of issuing rental book. Cards of shared books were arranged separately for facilitating shared issue on a separate counter. Students were invited collegewise (department were where necessary) to issue books as per scheduled programs.

4.2 Present system

From July 2000 onwards WINISIS (Windows version of CDS/ ISIS) is being used for requirement analysis in rental section. The collegewise list of all the rental books with book codes, author, title and number of copies available is displayed on notice board. A student submits the rental cards with details of books recommended by teacher. In the rental issue system first of all the students are called by notification for taking rental requisition form along with rental cards. Format of rental card is same as in the old system .

4. 2.1 Rental Textbook Issue Process

College wise dates of rental issueARE announced. As College of Technology (CT) students are more in number, they are invited batch wise. We bring out the list of shared books on notice board indicating number of student sharing per book. It helps students choose their partners for sharing. We issue shared book to one student and return his/her partner's card. The students can use this card in second round of issue for taking rental book. In second round we stop the share system and issue the books on first come first served basis.

The required number of copies for each book are taken out from shelves in advance and placed near the issue counters before starting issue activity every day. Shared books are placed separately near the share book counter. To ascertain the daily issue requirements in advance, we search from the student's database and issue notices. After searching we export this data

into ISO file. We create another database and import this ISO file into new database. This database is now treated as a master. Now we update inverted file of the new database and go to dictionary, here we find the book codes and the number of copies required on that particular day. We note down the book codes and the requirements (postings). The books are issued on three counters: two counters for individual books and one for shared books. At the time of issue we take out the rental cards and issue the books, stamp the due date and collect rent of Rs 10/- per book.

5. RENTAL TEXTBOOKS ISSUED

As we know that new and revised editions of textbooks are published in all subjects. The course contents are also revised from time to time, the demand for new editions of books is maximum. Older editions and damaged books are not in use. Some books need binding though we do the binding time to time. About 70% users are from College of Technology. During 1991-92 to 1996-97, approximately 15000 to 18000 books were issued annually. The rental charges being very nominal (up to Rs 2/- per book) during this period. Sometimes low rental charges tempt the students to obtain even lesser useful books also. From second semester of 1997-98 the rent per book was increased to Rs. 10/- per book. Consequently the number of books issued annually came down to 11000, it is 12000 during last three years. On an average, 15559 books were issued annually during the last ten years. Presently the average annual income from rental section to the library is about Rs. 1.22 lakh.

5.1 Advantages of using WINISIS Software

There are special advantages of using WINISIS software in the requirement analysis of rental books.

(*i*) Use of WINISIS software in this scheme has saved money, manpower and time of the university library. Earlier the complete rental issue system was taking about one month. The method of calculating requirement of books was lengthy, time taking and physically quite tiring. We had to re-arrange the entire cards authorwise and titlewise to know the required number of every book and ID numberwise according to college for issuing books. Most of the staff were engaged in

computing book share. Now rental textbook issue system involves less than one month, about a fortnight. Only two persons take 4-5 days in data entry of the book codes and students' information. After data entry, book share can be calculated immediately by updating inverted file in WINISIS.

(*ii*) The need for handling students cards before actual issue is altogether eliminated.

(*iii*)Earlier we used to take the cards in advance with the signature of student that he/she had received the book. There was a possibility of misuse of such cards.

(*iv*) The burden of picking out students cards for shared issue is eliminated.

(*v*) Issue requirements of next day is easily searched by Boolean logic search from the database. Earlier it was manually calculated.

(*vi*) Students' particulars and particulars of required books, both are counted into numerical codes which we find extremely easy.

(*vii*)For the first semester in the members' database only first year students (newly admitted students) records are entered while in the records of old students only book codes are entered rest of the details remains same. In the second semester only book codes are entered, rest of the details remain same.

(*viii*)Students find it quite convenient to get all the prescribed textbooks before exams within the first month of each semester.

6. CONCLUSION

Switchover from manual system to computerised system for data analysis using WINISIS software has resulted in reduction of total time consumed, of manpower and of repetition of clerical work. Besides it has ensured timely distribution of books to students' - a great help in their study. This data has proved to be a great tool for deriving much useful information for the management of rental textbook service. For example, assessing the requirement of rental textbooks which are very much in demand, weeding out of redundant / unused outdated titles.

This data endorses the fact that the rental service is amongst the very popular and useful services of the library. The library faces sever economic crunch in the present times. Therefore, normally it is not possible to purchase much-demanded books in the desired number of copies. In such circumstances in order to provide benefit of rental textbooks to maximum students within the limited resources, a unique system of book sharing in highly relevant devised by the library. The financial problem of this section can be managed effectively if the revenue generated from the service is allowed to be used for this section.

The rental textbook system of this library is a model service to be encouraged and applied by other libraries.

50

Hindi Database Management

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YAKUB ALI **

ABSTRACT

This paper discusses the various problems faced by libraries in handling the Hindi collection and its database. It tries to review the various constraints in the efficient management of the Hindi database, such as, the non-availability of standardised Subject Headings, Spelling Systems, Language Software, Computer Peripherals etc., which are very essential to systematically processes and organise the Hindi database. The authors try to impress the library professionals that it is possible to overcome the constraints by citing the Indira Gandhi Memorial Library of the Hyderabad Central University and its Library and its experience as an example.

1. INTRODUCTION

The need for information is ever growing and libraries play a major role in the collection, processing, organisation and dissemination of knowledge. To meet this growing demand various library operations are being automated to provide the user precise information at the right time.

India is a vast country with cultural and language diversity (spoken and written). There are approximately 250 languages and 800 dialects. Among them 18 are officially recognised

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languages and Hindi has been given the status of the national language. Sanskrit language has been officially allotted the status of classical language.

The primary education in India, especially in the government schools, is predominantly in the regional language. In the urban areas, most of the elite schools have English as medium of instruction, whereas the rural India is predominantly regional language based. Most of the educational institutions emphasise study and research in the regional language and literature. In fact, there are a number of Institutions which are exclusively concentrating on one or more Indian languages and their rich literature, folklore and culture, history etc. Therefore, there is a need for the proper organisation, dissemination of information regarding the library and its holdings of such institutions. Thie information is to be available to the users in the language, at the time and place of their choice. Thus the need is for the creation of a database of Indian languages and the appropriate access systems.

2. LIBRARY AND ITS INDIAN LANGUAGE COLLECTION

The technical processing of books in Indian languages, especially with regard to literature and languages is slightly problematic. Even a widely used Classification Scheme like DDC itself has relegated Indian languages and its literatures under "Other Languages" and "Literatures of Other Languages" under the class numbers 490 and 890 respectively. This lacuna is due to the DDC's bias towards European languages and literature. The Indian Languages have to share this small portion with other African and Asian languages etc. Further, among the Indian languages themselves, the many languages belonging to the Indo-Aryan and Dravidian group have been squeezed into a small slot.

Thus when a class number for a book on an Indian language fiction or dictionary is to be constructed it not only involves more time and effort on the part of the classification expert to analyse and assign appropriate number, but also it will be too long and cause problem in writing the number on the spine label. Brevity is the first casuality in this case.

Also, since standardised Subject Heading / Key word systems are not available for Indian languages, most libraries will have

to generate their own Keywords or adapt the ones available for English language, such as Library of Congress Subject Headings, Sears List of Subject Headings etc. In the case of automated systems, the Keywords are to be entered in roman script. So precision during retrieval process suffers.

Next, even cataloguing requires the adaptation of the bibliographic entries in the Devanagari or Dravidian script to a standard cataloguing code system. Preparation of the cards, Main Entry, added entries and the shelf list, also is a laborious process, as they are to be manually prepared, unless of course a separate typewriter for each language is available. Again typewriters are not available for all Indian languages.

Since the class number normally is very long, shelving of the language books causes confusion. In the case of general books (Social Sciences, Sciences, Arts etc.) shelving becomes even more complicated as the language of the book is other than the English.

To overcome these problems, suitable classification scheme and cataloguing system, which are amenable to easy synthesis, and shelving require to be adapted. During the planning and preparation of an adapted classification and cataloguing system, care should be taken to make it staff and user friendly.

3.AUTOMATION AND INDIAN LANGUAGE DATABASE BUILDING

In an automated environment, processing and building of a database of existing and current books in Indian languages involves more planning and effort as most of the library application software packages by default are in Roman script. Either separate software (in-house or commercial) is to be installed to process each language or transliteration method has to be employed to enter the bibliographical details in the system.

3.1. Constraints Encountered during Database Building for Indian Languages

- Lack of standard spelling system for Indian languages
- Non-availability of standardized codes for generation of Subject Headings /Keywords in the case of Indian Languages like the Library of Congress, Subject Headings or Sears List of Subject Headings.

- Non-availability of standardised Subject Indexing Provisions for Indian languages.
- Problems of data input for Indian scripts as all the software and the key boards are by default in roman script
- The library application softwares for Indian languages are still in development stage.
- Bi-directional scripts problem: Kashmiri and Urdu are written from right to left, whereas the default direction of any standard code such as MARC, UNIMARC, etc., is left to right. This problem gets reflected in the application software also.
- Sorting of multi-script data is still an unresolved issue. The software's automatic indexing systems are by default for Roman script. Hence merging of Indian language records, especially Kashmiri and Urdu language records, in OPAC becomes a problem.
- Users encounter difficulty in accessing / retrieving data regarding Indian Languages due to lack of precision in data input.

4. MULTILINGUAL SOFTWARE

There are a number of commercial software packages available for various European languages which facilitate bibliographical entries to be entered in the computer systems, but very few are available in the case of Indian Languages. Therefore, only a few libraries in India are able to efficiently and quickly convert their Indian language catalogue into machine-readable form. Cost is another deterrent factor in this effort of data base building. Some of the software's are listed below which are mentioned in the literature.

4.1. International Software Packages with Multi-Script facility

- DOBIS/LIBIS System of Technilib of Melborne (Australia) can create records for Greek Works both in Latin script and Greek script.
- ALEPH (Israeli system) supports five scripts (Hebrew, Latin, Cyrillic, Arabic and Greek). This software has the facility to display together two character sets (belonging to two different

scripts).

- VTLS (Virginia Tech Library System) facilitates creation of database of multi-lingual documents. Entry of the bibliographical details in the original script of the documents is possible through this system. This software has the facility for Indian languages.

Software Service Providers

- Computer Digest: A multi-lingual software digest with an extensive list of languages and translation software . (www.gv.com).
- VirtualWare Technologies: Offers dictionary, language and translation software. (www.allvirtualware.com)
- Winsoft Multilingual Softwares: developers of Win Text, a multi-lingual processor with extensive multi-lingual spell check (www.winsoft.fr)

4.2. The Indian Software solutions for Indian Scripts

- GIST (Graphics and Intelligence based Script Technology) developed by Centre for Development of Advanced Computing (C-DAC), Pune
- LEAP: a multi-lingual English-plus-All Indian languages word processor by C-DAC, Pune.
- Indian Script Utility and Script Processor: Developed by Central Institute of Indian Languages (CIIL), Mysore
- BHASHA Software: developed by CIIL,Mysore. The software accommodates toggling facility from roman Script mode to any Indian Script mode and vice-versa.
- VM 4005: A multi-lingual display terminal package developed by VXL Instruments Limited, Bangalore.
- TLMS (Total Library Management Software), Pune. This facilitates creation of multi-lingual documents through the entry of bibliographical details in the original language of the document.

4.3 Multilingual Databases

Internet site :www.google.com/multilingual database

- **EuroWordNet:** EuroWordNet is a European Resources and

Development Project by the Human Language Technology Sector of the Telematics Application Programme. It has a big lexical database/Thesaurus, containing eight languages. This multilingual database has word nets for several European languages. This database can be used, among others, for monolingual and cross-lingual information retrieval.

- **Your Dictionary.com:** This is a leading global language portal which deals with 54 languages, multilingual computer dictionary etc.

5.TRANSLITERATION

The alternative method which can be used to enter the existing records in Devanagari or Dravidian script into the computer system is the method of transliteration. In this system, the bibliographical entries in the Indian script are entered using the roman script manually, unlike the books in English language software which has facility to import or export from one software package database to another.

The disadvantage in this is that, those users who are unfamiliar with the Roman script will not be able to utilise this facility to their advantage. Further, during the process of transliteration, there are chances of semantic (meaning) value loss, as well as phonetic (pronunciation) deviation due to the problem of script difference, and lack of standardisation of spelling/usage while in-putting the data. At times lack of proper grip on the roman script can also cause problems. All these can lead to a lot of errors and can reflect on the quality of database.

6. INDIRA GANDHI MEMORIAL LIBRARY A CASE STUDY

The Indira Gandhi Memorial Library (IGML) is a central facility supporting the teaching and the research needs of the Hyderabad Central University. Its users comprise of teaching and student community, mainly belonging to various Schools of the University and its Departments.

The Library has a rich collection of various types of reading materials, in many languages. Currently, the library has nearly 1.98 lakh Books and approximately 7000 back volumes of

journals and subscribes to nearly 712 journals. Apart from these, the library also subscribes to a number of magazines and newspapers in several languages.

Out of the total holdings, approximately 28,000 books belong to Hindi Language, another 27,000 belong to Urdu and around 25,000 to the Telugu Language. Another 1200 books belong to other Indian Languages like Bengali, Malayalam, Kannada, Tamil, Marathi, etc. Around 128 journals are in Indian Languages *i.e.* Hindi, Urdu and Telugu.

The Library purchases books and journals based on the recommendations received from the Deans of Schools/Heads of the concerned Departments, within the limits of budgetary provisions allocated by the Library Committee.

7. DATABASE OF HINDI LANGUAGE BOOKS

The scope of this paper is limited to the study of the various efforts made by the IGM Library to technically process, and organise the Hindi collection of the library. It also discusses the various problems encountered and how they were overcome.

The collection development of Hindi books commenced along with the general books in English language as well as in other Indian Languages. The books belonging to Hindi language are purchased based on the recommendations of the Head of the Hindi Department, as per the purchase policy of the IGM Library approved by the Library Committee.

Once the books are received in the Technical Section from the Acquisition section, the books are technically processed. The problems encountered and the various adoptions done to overcome the constraints during the technical processing *i.e.* cataloguing and classification etc. are mentioned below.

7.1 The Cataloguing

The cataloguing was being done manually until automation was initiated. In the absence of the availability of any standardized cataloguing code for Indian Languages, the AACR-2 code was adopted. The bibliographical details of the Hindi language books were written in Devanagari script in various fields similar to the English language books.

The various entries for each book i.e. the Main (Author) entry

and other added entries were all handwritten, which involved a lot of time, and the sorting and filing were also a very cumbersome process. Only the staff with Hindi language expertise were able to handle these works, which meant that the library had to have persons with dual knowledge of Library Science and Hindi Language.

7.2 The Classification

The classification of Hindi books has a two-pronged problem. One is concerned with the Literature and Language class; the other is concerned with the books of all other subjects. The IGM Library uses the DDC 18th edition to classify the books.

- **The books on Language and Literature class** The DDC bias in case of Non-Western languages is a major constraint while processing books in Indian Languages. The number 490 and 890 "Other Languages" are used to club all the languages and literature respectively, other than western origin. Thus, all the Indian Languages have to share a small slot/sub-division along with not only languages of other Aryan and Dravidian languages, but among themselves. Further, there are no scope for accommodating the innumerable Indian Languages and their dialects, which have not been enumerated in the Classification Scheme.
- **The Hindi language:** It belongs to the Indo-Aryan group and the number allotted in the DDC Classification Scheme for Indo-Aryan language and literature are 491.1 and 891.1respectively. For the Hindi language and Hindi literature, the numbers allotted are 491.43 and 891.43. And there is no scope/provision for accommodating dialects or any other aspects of Hindi Language, as is possible in the case of Western Languages.

7.2.1 The Adaptations

To overcome such constraint the IGM Library decided to adapt the system designed by CIIL, Mysore called, *Classification for Linguistics and Languages: a modified approach based on Decimal Classification* (Mysore 1973), with suitable modifications, in the case of literature class.

- **The Literature Class:** The number for main literature class has been taken as base number with appropriate alphabetic

index as an affix to individualise the books in concerned Indian language. The sub-divisions are also adapted to construct number for various aspects like form number or dictionary etc.

Example:

English Literature	**Hindi Literature**	
Poetry	821	H81
Drama	822	H82
Fiction	823	H83
Criticism - Fiction	823D	H83D

•**Books belonging to All Other Subjects and Language:** The classification Number for books written in Hindi language (Devanagari script) belonging to all other subjects (Sciences, Social Sciences, Arts etc.) and Hindi linguistics are same as that of books written in English language (roman script), with the individualising alphabetic affix of the concerned language.

Example:

English Script (Roman)	**Hindi Script (Devanagari)**	
Sociology	301	H301
Physics	530	H530
Music	780	H780

7.3. The Subject Headings / Key Words

Standardised Subject Headings/Key Words are not available as yet for Hindi language (Devanagari Script). To overcome this lacuna, the IGM Library provides the Key Words in English Language itself and not transliterated, on the lines of those assigned in the case of books in English language.

7.4. The Book Number

The first three alphabets of the Surname of the author are used as the Book Number for simplification and quick shelving.

Example:

Premchand	PRE
Bachan	BAC

Tagore TAG (Translated Works)

7.5. The Shelf Arrangement :

The books in Hindi Language are shelved as a separate collection. The shelf organisation and arrangement in each shelf is similar to the English language (roman script) books. That is, the books are organised in DDC class number order – 000 to 999, with books shelved from left to right in each rack. The "H" alphabetic affix individualising the Hindi books is ignored during the shelving (as the books are kept as a separate collection).

8. THE AUTOMATED TECHNICAL PROCESSING

The automation of the in-house operations of the IGM Library was initiated in 1989. The database of all the books written in English (Roman script) is now available in machine readable form. The current books are processed through the automated system. LIBSYS (LIBSYS Corporation, Delhi), a library application software is currently being used. LIBSYS System is an integrated software and has six menus – Acquisition, Cataloguing, Circulation, Serial Control, Article Indexing and OPAC (Online Public Access Catalogue). Apart from these, there are three more modules for House Keeping Operations-Record Keeping , System Set-up and Utilities.

8.1. The Current Conversion

The books received from the book suppliers are entered in the Acquisition Module through transliteration method. Once the acquisition process is complete, the data is available in the Technical Module. The procedures of cataloguing and classification have been already discussed. The difference is that only one manual card is prepared, which is maintained as a Shelf List Card. As once the bibliographical details are entered in the computer system, the system on its own generates the various Access Points – Author, Title, Classified Number, Subject, and Words in Title for Combination Search

The bibliographical details are entered through the transliteration Method. However, the key words are generated based on the DDC Schedule and clue words in the book itself and are entered as English language words for search and retrieval. In the automated environment, the unnecessary noise

words like prepositions, conjunctions etc are all eliminated and hyphens are entered between key words. This facilitates efficient retrieval of information as each key word / key word set is treated as a separate entity by the system.

Example:

Subject Heading :	CULTURE OF INDIA HISTORY AND POLITICS IN INDIA COMPUTER APPLICATIONS TO THE SUBJECT CHEMISTRY
Key Words:	CULTURE - INDIA INDIA - HISTORY - POLITICS COMPUTER APPLICATIONS - CHEMISTRY

8.2. The Retrospective Conversion

The retrospective conversion of the library catalogue is done on the sincelar lines as the current conversion and is almost at the completion stage.

9. PLAN FOR DIGITISATION

The IGM Library is now planning to digitise selected core collections, which will include books in Indian Languages too. To facilitate this process, the library plans to install the VTLS Software, which has the advantage of allowing the entry of any Indian language in its own script. At present, the details of books in the Hindi Collection of the IGM Library's Database are accessible through the Internet to the interested Users at his/her desk. Hopefully the books of the library will be available in text form itself through Internet at the earliest.

10. THE CONCLUSION

It may be discerned from the above discussion that there is a paucity of effort on the part of library professionals, the software developers and the language experts in developing necessary software, computer peripherals etc. suitable to the Indian languages and scripts. It is hoped that this paper will not only help in identifying the lacunae but also go a long way in inspiring the libraries and the professionals handling the Hindi Collection to overcome the constraints and develop their own adaptations to efficiently organise and manage the Hindi and other Indian

language databases.

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51

Computerisation of Pamphlets Section of Central Library of the Indian Institute of Technology, Bombay (IITB)

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ABSTRACT

The paper discusses about the computerisation of Pamphlets Section of the Central Library, IITB. The parameters such as creation of database, limitations, constraints, advantages and recommendations are discussed.

I. INTRODUCTION

Indian Institute of Technology, Bombay(IITB) being a scientific and technological research institute, there are number of on-going research programmes, consultancy assignments and sponsored projects in various departments. These activities result in interaction of institute with different industries in order to boost research and development and thereby, industrial output. In achieving these goals of the institute, Pamphlets section of the Central Library plays a vital role through acquiring special kind of literature like standards, patents, reports, pamphlets, and disseminate the information through Current Awareness services. Pamphlets are classified as special material in the library.

Presently, the section is approximately in possession of:

Pamphlets/Reports/Standards	60,000
Photocopies	4,500
Dissertations/Theses of Institutes	11,000
Indian Patents	1,00,000
Faculty Publications	700

*Central Library, IIT, Bombay.

Annual Reports 500

This Library started acquiring standards, technical reports, pamphlets in 1960. It was in 1988, that changes took place and Indian Patents, Dissertations/Theses, Photo-copies were brought together with Pamphlets/Reports/Standards.

2. OBJECTIVE

Special research material is housed in the section which cannot be issued and is accessible only to bonafide users. This has resulted in smaller number of documents which are loaned out. Objective of providing services to users remain unchanged but with different approach. In this regard, computerization of bibliographic data will certainly accelerate the speed of providing information to users. It will also have positive impact on visitors.

3. LIMITATIONS

3.1 Since the beginning acquiring and processing of pamphlets/reports/standards have been undertaken by the section and the work of computerisation was carried out for these documents only.

3.2 The data elements included in the database are as per the ISO-2709, but the designing of worksheet is not exactly the same as that of ISO-2709. AACR2 is not strictly followed. There are few local variations.

3.2.1 From April 1992, free text search terms were assigned and linked wherever those terms were used in the documents, LCSH were not used. Instead, access has been provided from words of title, as these documents do not have misleading or fancy titles.

3.2.2 As there are very few cases, no data element for series entry was selected.

3.2.3 Separate fields were not provided to translator, compiler etc. as the number was very less (not even 10%).

3.2.4 These documents have special features such as published in serial order. Universal Decimal Classification (UDC) is not used to retrieve the documents. We have designed our own system to locate particular document. In this system, an alphabet is assigned to each country *e.g.*

B- India

D- United Kingdom

L- United States of America

Country code is followed by the abbreviated form of the name of the organisation responsible for bringing out the publication and year *e.g.* An Indian Standard 8829 published in the year 1978 can be denoted as

BISI-8829:1978

Where, -,: are used as separator

3.2.5. Generally, corporate authorship except in few cases of reports, pamphlets where we have principal authorship, fields are provided up-to 2 authors only.

4. CREATION OF DATABASE

We have noticed over the years that no library can have their collection recorded in 100% scientific manner. The work of creation of database was of foremost importance to keep pace with modern trend. Thus, this work was undertaken in following order:

4.1. Selection of Data Elements for Pamphlets/Standards/Reports

- Accession number
- Author 1. – corporate or principal author with surname, forename
- Author 2. - joint author
- Pages – number of pages
- Year – year of publication
- Abstracts Y/N – whether document has abstract or not
- Abstract entered Y/N – abstract are not entered
- Document type – S-standard, R-report, P-pamphlet
- Organisation – name of the issuing authority
- Subject only incase of NASA reports.
- Place – place of publication
- Our code – assigned by the section
- Updated code – revision
- Part/section – part, section if any

- Title – title of the document
- Sub-title – subtitle of the document
- Publisher
- Cost of the documents in Rupees
- Cost of the documents in other currency (use ISO 817)
- UDC – number whenever given in the document
- Country – name of the country (use ISO 3166)
- Reference – cross reference of other
- Prerequisite–issuing authority / superseded or replaced by standard
- ISBN – number
- Key words – as given in the documents/free text.

Pamphlet Menu provided 5 options.

1. Data entry
2. Modifications
3. Browse
4. Print
5. Quit

4.2. Pilot study

This study was undertaken to create a database of the Pamphlets/ Standards/Reports. The types of the documents are approximately as under:

Pamphlets	5,000
Reports	20,000
Standards	35,000
Total	60,000

Approximately 1% of variety of total documents were included for the study. Data Entry Operators (DEOs) were assigned the job. The data were directly taken from the documents. This helped us in designing the database. The data required approximately 100-125 Mb storage space in the computer, considering growth for the next five years.

Further analysis of institution-wise types of documents is

shown in tabular form:

Standards		Technical	Reports	Pamphlets	
Name of Institution	No. of Standard	Name of the Institution	No. of Report	Name of Institution	No. of Pamphlets
BSI	17,215	NASA	10,895	SAE	199
BIS	14,545	TRB/HRB	3,456	IGIDR	123
ANSI	809	HMSO/ARC	1,514	IGC	119
IEEE	373	NRC	384	IIM	77
ASTM	219	IGE	359	CPD	64
IRC	166	BSIRA	296	MISC.	4,418
IP	139	IIT	231		
ISO	25	NIST	229		
MICS.	2,009	ISRO	132		
		CSIRO	87		
		NAL	63		
		IGBP	44		
		MISC.	1,793		
TOTAL	35,000		20,000		5,000

4.3. Undertaking of actual project

There was a debate whether 60,000 documents, which are not much issued can be computerised? The question is not merely issue but providing services at personal level. Statistical data indicate that a large portion of the collection have corporate authorship *i.e.* similar type of documents for data entry which students can easily do. Under such circumstances help was sought from students under earn and learn scheme. They were paid Rs.20 per hour. The only difficulty with students was, high mobility. Slots of 2 hours each or more were allotted to each student. After data entry print-outs were taken and data were checked. Corrections were made in corresponding entries. It is interesting to note that 45,000 documents were completed in 3500 hours and Rs.70,000 was paid.

Thus, it worked out to be Rs. 1.56 per document. We may mention here that required infrastructure of hardware and software was available in the library. So the initial cost of installation and allied peripherals are not accounted for.

After entry, editing, checking, retrieval is to be done. Help of LAN personnel was sought to write software for retrieval. The display format had following data elements:

- Number of record
- Author 1
- Title with subtitle
- Code number
- Updated code
- Publisher
- Place
- Year
- Organization
- Country
- Pages
- Type
- Accession Number
- Cross reference
- Total Number of records retrieved on particular subject

It is an 18th option in Online Public Access Catalogue (OPAC) of our library.

5. CONSTRAINTS

(*i*) Appropriate training and guidance to staff and users

(*ii*) Provision of backup for keeping the hardware in the working condition

(*iii*) Availability of an expert to solve problems such as virus

(*iv*) Preventive measures against password, maintenance contract, security of data

(*v*) Computer phobia of staff and users

(*vi*) Ergonomically designed work stations

(*vii*) Upgrading hardware

6. ADVANTAGES

(*i*) Network environment facilitates multi-users accessibility

(*ii*) Enhances retrieval and communication

(*iii*) Attracts more visitors

(*iv*) List of additions sent electronically every fortnight

(*v*) First hand experience of work done

(*vi*) Enhances checking of suggestions

(*vii*) Library staff and users become familiar with library resources

(*viii*) Enhances productivity and efficiency of library service

7. RECOMMENDATIONS

(*i*) Computerisation of in-house activities

(*ii*) Provision of options to generate different types of reports

8. CONCLUSION

The medium-sized libraries can be motivated to generate confidence and computerise their libraries. We designed our own system to arrange the documents. This system is working well and with few local variations in AACR2, database was created. Subject, and code number approach is the main requirement of the users. The system fulfils this requirement in-spite of few limitations. Computerisation has provided high quality of reproduction, compact storage capacity, speed of communication and online access, more accurate and better services to the users.

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52

Biotechnology Information System Network (BIOINFORMATICS): A Case Study of Devi Ahilya Vishwa Vidyalaya, Indore

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ABSTRACT

This paper identifies the different types of bioinformatics centres located in various organisations engaged in research, education and training, administration and programme implementation relating to biology and biotechnology. The Biotechnology Information System Network has an apex centre. These centres have been grouped into the Distributed Information Centres (DICs) and Distributed Information Sub-centres (Sub-DICs). All the centres are interlinked through satellite communication system, each providing information support in specific areas of biotechnology and helping in the diffusion of scientific information across the network. The paper also explores the bioinformatics sub-centre at Devi Ahilya Vishwavidyalaya, Indore.

1. INTRODUCTION

Information is a powerful tool for research and developmental activities. It is also useful for the development of biologists, bioinformaticians, and researchers in the field of biology. Dissemination of information is a prerequisite for any development scheme meant for bringing change in all walks of

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life. Thus, bioinformatics has a significant role in the developmental issues of concerned fields.

The word biology consists of two words *i.e*,botany and zoology which mean the study of living cells. The cell is fundamental unit of living things The study of cells is called cytology[1]. The cytosine, a nitrogenous base derived from pyrimidine, is one of several types of bases that are. incorporated into a nucleic acid molecule. Nucleic acids are composed of a five carbon sugar bound to a phosphoric acid, along with a nitrogen base. Deoxyribo-nuclic acid (D.N.A.), the hereditary material of most living organisms, consists of the five carbon sugar deoxyribose with a phosphate linkage, to which is attached cytosine or any of three other bases, which together form two complementary pairs. Cytosine's complementary base in the DNA molecule is guanine.

An organism's hereditary and functional information is stored as DNA, RNA and proteins, all are linear chains composed of smaller molecules. DNA is made up of four deoxyribonucleotides (adenine, thymine, cytosine and guanine). RNA is made up from the four ribonucleotides (adenine, uracil, cytosine and guanine) and proteins are made up from twenty amino-acids.

Now, it is quite obvious that acquisition, collection, storage,and retrieval of such a huge data and facts of biology and biotechnology are very difficult. But with the help of Biotechnology and Information Technology *i.e.* Bioinformatics it is now possible to some extent. The basic difference between Biotechnology and Bioinformatics is as follows :

The word Biotechnology is made up from biology and technology. Thus, biotechnology is a technology that uses living organisms or components of livmg organisms or biological process to make or modify products and to improve plants, animals or microorganisms for specific use/service of mankind.

Similarly, Bioinformatics is derived from two words *i.e.* Biotechnology and Information Technology, Thus, Bioinformatics is a new term referring to the discipline that employs computers to store, retrieve, analyse and assist in understanding biological information. It is a newly emerging interdisciplinary research area spanning a range of specialities that include biology, biophysics, computer science, mathematics and statistics.

Bioinformatics is defined as a scientific discipline that compasses all the aspects of biological information like acquisition, processing, storage, analysis, distribution and interpretation that combines the tools and techniques of mathematics, computer science and biology with the aim of understanding the biological significance of a variety of data.

In other words bioinformatics is the subset of the larger field of computational biology, the application of quantitative analytical technologies in modelling biological systems The science of informatics is concerned with the representation, organisation, manipulation, distribution, maintenance and use of information, particularly in digital form. Basically, bioinformatics is the combination of two words *i.e.* biology and informatics. The functional aspect of bioinformatics is the representation, storage and distribution of data. Intelligent design of data formats and databases,creation of tools to query these databases and development of user interfaces that bring together different tools to allow the user to ask complex questions about the data are all aspects of the development of bioinformatics infrastructure. Developing analytical tools to discover knowledge in data is the second aspect of bioinformatics.

2. BIOINFORMATICS NETWORK

Internet is a network of computers and it is used for communication, information access, information dissemination. Internet is a global collection of interconnected interlinked computer networks or network of networks. Thousands of computer networks and millions of individuals computers throughout the world are connected using Transmission Control Protocol/Internet Protocol(TCP/IP). The importance of information technology has been recognised for pursuing advanced research in modern biology and biotechnology. Biotechnology Information System is a network. This network consists of several information centres which are interconnected and interlinked through computers. A bioinformatics programme, envisaged as a distributed database and network organisation, was launched during 1986-87.

This network is playing a significant role in transfer and exchange of information, scientific knowledge, technology packages, and references in the country involving scientific

personnel. The entire network has emerged as a very sophisticated scientific infrastructure for bioinformatics involving state-of-the-art computational and communication facilities. The computer communication network, linking all the bioinformatics centres, is playing a vital role in the success of the bioinformatics programme. Database development, R&D activities in bioinformatics, human resource development and a variety of services in support of biotechnology R&D programmes and projects, have made this programme very popular and useful to the scientific community.

3. ACCESS TO BIOTECHNOLOGY INFORMATION SYSTEM NET

This is the first major S&T network in biotechnology in the country, networking 55 bioinformatics centres (an apex centre, 10 DICs and 44 sub-DICs) through satellite and terrestrial links provided by NICNET. Internet access is provided by three major network service providers in the country *viz.*, NICNET, ERNET and VSNL. The BTISnet permits remote login, file transfer, E-mail, etc, as well as connecting to various international networks which are providing up-to-date information support on all aspects in biotechnology ranging from bibliographic information to sequence analysis and management information.

The network approach had been very useful in the successful implementation of the project as it is enabled to establish a link between diverse groups of scientists working in various interdisciplinary areas of biotechnology. The network encouraged sharing of knowledge and greater interaction amongst the scientific community irrespective of their respective geographical location in the country.

4. STRUCTURE OF THE BIOTECHNOLOGY INFORMATION SYSTEM NETWORK IN INDIA

An Apex Centre at the Department of Biotechnology, ten Distributed Information Centres, and 44 Distributed Information Sub-centres, established in universities and research institutes of national importance, are fully engaged in this task. All the centres are interlinked through satellite communication system, each providing information support in specific areas of biotechnalogy and helping in the diffusion of scientific

information across the network. Six national facilities have been set up for interactive graphics-based molecular modelling and other biocomputational needs. Four long-term courses at the level of post-MSc Diploma in Bioinformatics, at Poona University, Jawaharlal Nehru University, Calcutta University and Madurai Kamaraj University, are fulfilling the long outstanding need for trained human resources in this interdisciplinary area.

The BTIS secretariat working under the Department of Biotechnology at the Apex Biotechnology Centre is a coordinating and developing organisation controlling and guiding the bioinformatics centres.

4.1 Apex Biotechnology Information Centre (BTIC)

It is responsible for coordinating, organising and providing information services at the national level covering a wide range of subjects on large sectors of national endeavours in biotechnology. It is also responsible for hosting of a home page on the activities of the Department of Biotechnology and its major programmes, as well as maintaining several directories and databases on the research projects funded by this department. A Biotechnology Patent Facilitating Cell has recently been established which uses the facilities of the BTIC to provide full scale patent search services. The BTIC has the mandate to continuously assess information requirements in biotechnology and organise creation of necessary computer and communication infrastructure to provide bioinformatics support to the national community of users spread across the country.

It endeavours in establishing national databases in the country in collaboration with several national and international agencies and also encourages bilateral and international collaboration in bioinformatics. It also initiates major research projects in bioinformatics for creating synergy for developmental activities in bioinformatics and promotes standards for databases, data exchange and nomenclature for molecular biology data in order to facilitate sharing of such data amongst laboratories on a national and international scale. BTIC has established a Website to provide a window to all the bioinformatics resources in the country and would provide appropriate linkages with all the centres established under this programme.

The centre has developed a major directory on the "Research

Profile of Biotechnology Activities" in the country listing more than 200 institutions. This directory is now available on Internet. A database on R&D projects sponsored by DBT is being maintained by this centre. A patent facilitating cell established recently in the department undertakes requests for searching patent information on the Internet. A dedicated team of scientists and professionals from DBT and NIC shoulder the responsibility for the maintenance of the sophisticated computers and communication infrastructure, in addition to providing essential services.

4.2. Distrubuted Information Centres

Ten DICs have been established with the task of providing discipline-oriented information to all institutions belonging to the branch as well as other institutions and individual users interested in particular subject related to biotechnology. These institutions are as follows:

4.2.1 Genetic Engineering

(*i*) Indian Institute of Science, Bangalore

(*ii*) Madurai Kamaraj University, Madurai

(*iii*) Bose Institute, Calcutta

(*iv*) Jawaharlal Nehru University, New Delhi.

4.2.2. Animal Cell Culture and Virology

(*v*) University of Poona, Pune.

4.2.3 Plant Tissue Culture, Photosynthesis and Plant Molecular Biology

(*vi*) Indian Agricultural Research Institute, New Delhi.

4.2.4 On Cogenes, Reproduction Physiology, Cell Transformation, Nucleic acid and Protein Sequences

(*vii*) Centre for Cellular & Molecular Biology, Hyderabad.

4.2.5 Immunology

(*viii*)National Institute of Immunology, New Delhi.

4.2.6 Protein Modelling and Protein Engineering

(ix) Institute of Microbial Technology, Chandigarh

4.3. Distributed Information Sub-Centres

A large number of R&D institutions and universities now form chain of distributed Sub-centres set up in geographic locations affiliated to each DIC in their respective area. While the Distributed Information Centres act as repository of information in their respective specialised disciplines, the Distributed Information Sub-centres provide an access mechanism for the information to be available at the universities, R&D and manufacturing institutions. Thus, the distributed Sub-centres provide an added dimension of access and diffusion of information across the network. Forty four Sub-centres have already been established at the locations listed below:

- Aligarh Muslim University, Aligarh
- All India Institute of Medical Sciences, New Delhi
- Anna University, Madras
- Assam Agricultural University, Jorhat, Assam
- Banaras Hindu University, Varanasi
- Banasthali Vidyapeeth, Banasthali, Rajasthan
- Bharatidasan University, Tiruchirappalli, Tamil Nadu
- Biotech Consortium India Limited, New Delhi
- Birla Institute of Scientific Research, Jaipur, Rajasthan.
- Central Drug Research Institute, Lucknow
- Central Institute of Fresh Water Acquaculture (CIFA) Bhuvaneshwar
- Central Institute of Medicinal & Aromatic Plants, Lucknow, Uttar Pradesh
- Central Sericulture Research & Training Institute, Mysore
- Devi Ahilya Vishwavddhyalay, Indore
- Dr.YS.Parmar University of Horticulture & Forestry, Solan, (H. P)
- G. B. Pant University of Agriculture & Technology, Pantnagar, Uttar Pradesh
- Guru Nanak Dev University, Amritsar
- Himachal Pradesh University, Shimla

- Indian Institute of Technology, Kharagpur, West Bengal.
- Indian Institute of Technology, New Delhi
- Indian Vetermary Research Institute, Izatnagar
- Kerala Agriculture University, Thrissur
- MS.University of Baroda, Baroda
- Mahatma Gandhi Institute of Medical Sciences, Wardha
- MS Swaminathan Research Foundation, Chennai
- National Dairy Research Institute, Karnal
- National Environmental Engineering Research Institute, Nagpur
- National Institute of Oceanography, Goa
- North Eastern Hill University, Shillong, Meghalaya.
- Pondicherry University
- Punjab Agricultural University, Ludhiana, Punjab
- Regional Research Laboratory, Jammu & Kashmir.
- Tami Nadu Agricultural University, Coimbatore
- Tamil Nadu Veterinary & Animal Science University, Madras
- Tata Memorial Centre, Mumbai
- Tropical Botanical Garden & Research Institute, Tiruvananthapuram, Kerala
- University of Calcutta, Calcutta
- University of Delhi (South Campus),New Delhi

4.4. European Molecular Biology Network in India

The European Molecular Biology Network (EMB net), is a science-based group of 37 collaborating nodes throughout Europe and a number of nodes outside Europe. EMB net has evolved into a worldwide organisation bringing bioinformatics professionals to work together to serve the expanding fields of genetics and molecular biology. The combined expertise of all nodes allows EMBnet to provide bioinformatics services to the research community and this encompasses more than what a single node can provide. Bioinformatics at CDFD is recognised as the national node of the EMBnet.

The EMBnet India Node provides bioinformatics services in

the form of browsing bio-molecular sequence databanks, macromolecular structure databanks, genome and other useful databases. It provides in-house services for the comparison and analysis of sequence/structure/genome data protein 3-D modelling molecular graphics. The Node also conducts in-house training for the use of commercial software such as GCG and Insight II. The research interests focus on protein sequence and structure analysis, protein modelling, drug design, genome analysis and databases.

An EMBnet node was also considered for India and mirrored at Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad. It provides in-house services for the comparison and analysis of sequence/genome data, protein 3-D modelling and molecular graphics. The research interests focus on protem sequence and structure analysis, protein modelling, drug design, genome analysis and databases. The URL for this site is www.cdfd.org.in.

4.5. Mirror Sites-Address

EMBnet, CDFD, Hyderabad	:	www.cdfd.org.in
PDB, IISc, Bangalore	:	iris.physics.iisc.ernet.in
GDB, IISc, Bangalore	:	pranag.physics.iisc.ernet.in
EBI Databases, University of Pune	:	bioinfo.ernet.in

4.6. Facilities on Interactive Graphics and Molecular Modelling

Six biocomputing facilities under the umbrella of National Facilities on Interactive Graphics and Molecular Modelling have been established with the task of providing discipline-wise facilities to the scientists working in the area of molecular structure modelling, 3D structures, active site modelling, crystal structures, conformational analysis, protein and DNA structures and interactions, homology studies and the like. These biocomputing entres are located at :

(*i*) Indian Institute of Science, Bangalore

(*ii*) CCMB, Hyderabad

(*iii*) Madurai Kamaraj University, Madurai

(*iv*) University of Poona, Pune

(*v*) Bose Institute. Calcutta

(*vi*) Jawaharlal Nehru University, New Delhi

5. OBJECTIVES

The BTIS Network has been established to meet the following broad objectives :

Handling and management of biological data, including its organisation, control, linkages, analysis and so forth;

Communication among people, projects and institutions engaged in the biological research and applications. The communication may include e-mail, file transfer, remote login, computer conferencing, electronic bulletin boards, or establishment of Web-based information resources;

Organisation, access, search and retrieval of biological information, documents and literature,and;analysis and interpretation of the biological data through the computational approaches including visualisation, mathematical modelling and development of algorithms for highly parallel processing of complex biological structure and Human Resource Development in bioinformatics.

6. FUNCTIONS

The principal objectives of a Bioinformatics Centre is to function as an information base in each speciality so that the scientists have ready access to the computer-based information on resources, databases in subject field; and to build up expertise in bioinformatics in keeping with the rapid development in this area

It is to provide a computer-based information storage and retrieval system of databases collects structured information generated by research and industrial institutions in the identified fields of biotechnology and continually update the databases and make the information available to the users.

It is an active network mode, in which the scientists get access to the biotechnology community in the identified areas. It answers request for information in an interactive and discussive mode and activery initiates dialogue among groups with common interest.

It is to provide retrieval service either online or off-line in

their specialised areas and to give overall information support even in areas other than those assigned to them.

It is to provide communication link with international databases for selective bibliographic information as well as access to molecular biology data for the user scientists,

It is to develope software packages and data bases specific to user needs.

It is to conduct training courses in the specialised areas periodically to meet the special requirements of manpower development in the area and to promote awareness about the computerised storage and retrieval facility among bioscientists and information scientists.

7. HUMAN RESOURCE DEVELOPMENT

A number of workshops and training programmes were conducted under the BTIS programme on the use of computers and databanks in modern biology and biotechnology. Considering the importance of the subject, some institutions and university departments have introduced a formal course of training in bioinformatics as a 3-credit one-semester course in their existing post graduate programmes in biotechnology. DBT has initiated a long-term academic course in bioinformatics leading to the award of an advanced diploma in bioinformatics. The course is being conducted by Madurai Kamaraj University; Pune University; Jawaharlal Nehru University and Calcutta University. There has been a sudden spurt in the demand of such professionals by small size gene-hunting companies. Many of the larger pharmaceutical companies are now seeing real value in gene mapping and sequence data and have started attracting experts from academia. In the light of these developments, the efforts of DBTare likely to be rewarding towards generation of employment opportunities. Apex Bioinformatics Centre has brought out a national training calendar for the year 1998-99 of the training programmes conducted by various centres and sub-centres and will continue to publish annual calendar every year so that the training facilities are utilised by a large number of scientists and research personnel.

8. DEVI AHILYA VISHWAVIDHYALAYA, INDORE

Devi Ahilya Vishwavidhyalaya, Indore is a Distributed

Information Sub-centre of bioinformatics. The details of which are given below:

8.1 Establishment

University of Indore came into existence in 1964. However, university teaching departments got started in 1970 with the construction of Vigyan Bhawan. In 1980's, Government of Madhya Pradesh changed its name to Devi Ahilya Vishwavidyalaya in the memory of late Devi Ahilya who ruled the area for several years. She was so popular that even today, people of Indore consider her equivalent to a goddess. At present, the university is having 25 schools of study, which provide quality education. School of Biotechnology was started in 1991 with the financial assistance of Department of Biotechnology, Ministry of Science and Technology, Government of india, New Delhi.

The Bioinformatics Centre at Devi Ahilya Vishwavidhalaya, Indore was established in'1993 under Biotechnology Information System of DBT, as one of the Distributed Information Subcentres. The main function of the Centre is to act as a member of BTIS Network for providing information to the interested users on topics pertaining to the relevant areas of biotechnology. The functions of the Centre include, among others, acquisition, creation and development of software and databases needed by the users.

The Centre is well-equipped with modern computer and communication systems. The services ǿffered by the Centre include off-line search through the CD-ROMs. The Centre is actively involved in the development of databases and training of manpower. It has acquired important software useful in the field of bioinformatics. These include : Primer Premier, Plasmid Premier, MATLAB (with all tool boxes). Several training programs /workshops have been organised successfully by the Centre to train the researchers in the field of bioinformatics. During the past four years the Centre has published many papers and many more have acknowledged the use of the facilities available at the Centre. The Centre also participated in various national symposiums and workshops.

8.2. Research and Development in Biotechnology at Devi Ahilya Vishwavidhalaya, Indore

The Centre is engaged in the field of DNA analysis using biosoftwares. It is actively doing research for the development of new algorithms for DNA analysis especially in the field of primer designing for PCR. It has also provided assistance in the development of freeware software for the analysis PCR primers which is available free of cost on the Internet to all the users. It is also engaged in development of database for plant taxonomy.

Besides, the Department is doing work in the field of enzyme technology. It is particularly interested in the enzymes of carbohydrate metabolism ,especially those enzymes which are industrially important. It has developed laboratory scale technology for the production of glucose-I-phosphate and low methoxyl pectins. It is having expertise in the field of enzyme immobilization. The school is also engaged in doing research on waste management and biomodelling of the reactors. Not only this, the school is collaborating with CIMAP, Lucknow for research in the field of medicinal plants; with NCCS, Pune for research in the field of immuno technology; with RRL, Jammu for research in the field of genetic engineering (for generating engineered microbes for vitamin C production); with CBT, New Delhi in the field of hydrogen production from plant waste.

8.3. Bioinformatics Facilities at The Devi Ahilya Vishwa Vidhalaya, Indore

Major computer equipment available are:

Hardware

Servers (a) HP Vectra IBM Netfinity 5000

(b) IBM Netfinity 3000:

LAN of 8 computers with 200 ft. networking

Computers: Wipro No. 01 PII 266 MHz

LPL No. 01 PII 166 MHz

PCL No. 01 (386) D-Link, Internet Server

Printers: Inkjet Color Printer 01 (HP 670 C)

Dot matrix 03 (Panasonic KX- P2624)

External CD-Rom, Hitachi CDR-1900S

Modem: Motorola, Lifestyle 33.6, D-Link 56.6, CD Writer (HP Plus)

UPS: 2.0 KV (The Guardian)+ 3.5 KV

(Through M.Sc. Biotechnology programme three more computers (IBM 300GL, PII 300 MHz which are installed on LAN) have been availed of.

System software

Windows NT Server (10 clients)

Foxpro 3.0

Windows 95,98

Lotus SmartPro, MS Office 97

MatLab (With all tool boxes)

Application software developed in house

NET PRIMER (Freeware software for analysis of Primers in collaboration with Premier Biosoft Indore, Indore)

PCR RECIPE (Software for calculation of Master mix components for PCR)

OLREA (JAVA software for online analysis of restriction enzymes)

8.4. Databases Available at The Devi Ahilya Vishwa Vidhalaya, Indore

Genbank on CD (Last version)

Derwent Biotechnology Abstracts

Current Contents (Life Sciences)

Communication & Data networks being used by the Centre

8.5. Training And Educational Activities

DAVV Centre, Indore teaches M.Sc. students of the Department two papers on bioinformatics. All the activities are carried out at the Centre. Students at the Centre are trained to use computers and programming etc. The Centre provides free facility to all the students and faculties in the campus for E-mail/Internet and trains them to use the facility like sequence search, submission, analysis,etc. It also provides free reference searching through our CD-ROM database for *Current Contents* and *Biotechnological*

Abstract and *Gen Bank* to all the users.

8.6. Databases in India For Genomic Research

The Department of Biotechnology Government of India has created several internationally recognised databases in India under the National Jai Vigyan Science & Technology Mission for Genomic Research. These databases are available at Indian Institute of Science (IISc), Bangalore; University of Pune, Pune; Jawaharlal Nehru University (JNU), New Delhi and institute of Microbial Technology (IMTECH), Chandigarh. The databases will be in the form of Mirror Sites, such as Genome Databank (CDB), protein database (PDB), plant genome databases and databases and software hosted at European Bioinformatics Institute(EBI) The advantage of mirroring these databases from India will be to provide unhindered access to large amount of databanks for analysis of not only the primary information but also the secondary information sources. Important research leads are expected to be generated through in-depth analysis of such data and it is hoped that these Mirror sites will act as knowledge pathways for discoveries in modern biology and biotechnology. The following are the uniform resource locators for some of these sites which have started functioning:

1. GDB : pranag.physics.iisc.ernet.in
2. PDB : iris.physics.ernet.in
3. EBI : bioinfo.ernet.in

The other uniform resource locators and change of uniform resourcs locators can be viewed at the department's Web12

site www.dbtindia.nic.in.

8. CONCLUSION

Bioinformatics is playing a vital role on the growth of agricultural, industrial, pharmaceutical and medical sectors. The bioinformatics is the backbone of the research and development activities in various fields like genetic engineering, biocristallography, biocomputing, molecular modelling, etc. Bioinformatics is to help carry out basic and fundamental research in various aspects of both physical, chemical and biological sciences. The scientific understanding at the cellular and

molecular levels of biological systems and development of technologies based on these have enabled increase in the agricultural productivity, development of vaccines, diagnostics, drugs, improved animal husbandry practices, environment friendly technologies and several tools for conservation of biological diversity.

Information is the need of the hour. Therefore, need of the information for researchers is of great importance. Information systems operating in the field of biology will bring about transparency in research and development and also will be fruitful for bioinformaticians and others who are engaged in the concerned field. Qualitative development of the concerned field can not be made merely by establishing the lattice of information centres. Therefore, it is a dire need to cover the entire area for the overall development of the nation particularly in the field of biological sciences.

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53

The Challenges of Networking: Use of Hybrid System in Indian Libraries

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ABSTRACT

In this paper the Hybrid Library as an Online Information Access Tool, traditionally like OPAC in which the role of catalogue is an information server has been discussed. It is also discussed how this server can integrate with some full text data for easy and quick retrieval and how other data should be retrieved and stored in a hybrid information environment. At the end it is seen how networking becomes an important tool to design the architecture of Hybrid Library System.

1. INTRODUCTION

IT revolution made drastic changes in every walk of life. The paradigm of library services gets changed continuously. Traditional services are going to be obsolete and new techniques for information procurement, organisation and access to assuming information will be generated regularly. Digital impact has converted library into real time and they are now the form of electronic/digital or virtual library. In the age of Internet a Librarian will have to perform the role of Cybrarian. Networking provides us new means for sending our information to wide range of audience/clients with the use of standard protocols. Hybrid system of libraries is developing by integration of conventional and electronic documents. Hybrid system of libraries reflect the transitional state of the library, which today can neither be fully print-oriented nor fully digital.

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2. HYBRID LIBRARY *Vs* ONLINE INFORMATION ACCESS TOOLS

The hybrid library is a library which can provide both hardcopy and electronic/ digital resources. Its information access tools comprise an information server which provide the end user with a seamless interface that will allow them to locate hardcopy available locally and at the same time allow to access relevant online resources electronic/digital publications outside the library by the use of web-sites, may be Internet or intranet. To fulfil this user need, some front-end access environment to access variety of databases, which contain various information in different formats.

Formally in electronic/digital libraries, users can access multiple information in a single platform or a single front-end access. Now by networking through LAN or WAN multiple users can access multiple information at the same time. This environment is called hybrid library system.

3. INTEGRATED HYBRID ENVIRONMENT

The integrated environment is widely used in the context of hybrid information environment in which the role of the developer is to provide a strategy to select appropriate service to ensure the link for end users' online accessibility with a compatible database. The developer designs an web-enabled/ server-client module in which he uses some web developing languages like Java, .net, C+ etc. In server site he uses server-scripting language like ASP through which the end user/client's requests are accepted and replied back.

Integrated hybrid environment can be established by the use of FTP of data files to FTP server by which data can be updated regularly for online access. This process is called data uploading. End-user can procure their desired information by Hypertext Transfer Protocol (HTTP). FTP permits the user to transfer a copy of data file across the Internet/Intranet from one computer to another to establish a communication with a remote machine and obtain authorisation by sending a login and a password. The user can list the file available on the remote machine, request a copy of particular file or send a copy of local file.

Another way to establish an integrated hybrid environment is time-sharing system for remote login service which is found in a protocol called Telenet in which remote login client and remote login server can interact with each other. Telenet permits multiple users to run programs simultaneously. Each user is assigned a login identifier and secret password.

There are three different environments like WAN, LAN, and Local through which user can access metadata.

4. WAN HYBRID ENVIRONMENT

The WAN environment contains the collection of machines that are connected by communication technologies using different subnet through which they can communicate message from each other like telephone environment. The communication among clients is carried by some transmission lines or switching techniques. The switching techniques are used to connect two or more transmission lines. The WAN environment use satellite or ground radio system in which all routers can send/receive information. In this type of system the client can access electronic/digital resources via Internet through remote machine using Web-enabled module. The user can access either bibliographic or full text of metadata.

5. LAN HYBRID SYSTEM

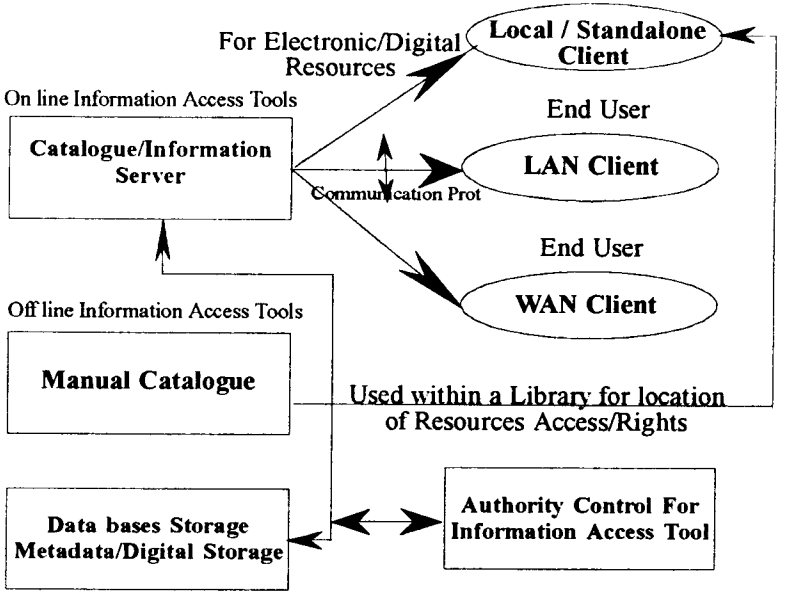
Generally it is used privately on network within a single organisation upto few kms. It is widely used to connect workstations for integrating and exchange of information. This is a transmission technology consisting of single cable to which all the machines are attached. It runs at the speed of 10-100Mb/s. In this type of system the client can access resources *via* Intranet. Types of LAN may be Ethernet, Token Ring network or Peer-to-Peer network depending upon the topology and configuration of cabling.

6. LOCAL/STANDALONE HYBRID SYSTEM

Client can access hardcopy or electronic/digital resources within a library, one user can access at one time. This type of system is confined to the premises of library itself only. Terminals are kept to access information by OPAC.

7. ARCHITECTURE OF HYBRID LIBRARY SYSTEM

Hybrid library system is to be designed for both, access of conventional and electronic/ digital resources.



Hybrid Library Architecture

The above architecture of hybrid library system are in infant stage in most of the Indian libraries, while libraries of developed countries are in better position. Prerequirements for setting above infrastructure are as follows.

Concepts Hybrid library is a process of integrating traditional and online library.
Resources can be accessed with a seamless interface.
Integrated accessed.

Infrastructure Client/Server
Many library OPAC use Z39.50 Client capability

Hardware Latest PC – Pentium III, 128 RAM, 8GB HD (minimum)
CD Tower, HD Tower

Scanner and CD Writer

Software NT 4.0/Linux/Unix
Web Server
Acrobat pdf Writer and Reader

The terminology used above for designing hybrid library can be described in following terms:

7.1 Online Catalogue/Information Server

It's an online information access tool, traditionally like OPAC which provides seamless interface to access conventional or electronic/digital resources to the end user with a front end or user-friendly environment. The end user may be the local/LAN client or WAN client. The information server contain high capacity of information, it may be hard disk tower, or CD-net.

7.2 Off-line Information Access Tools

These are traditional catalogues of libraries. At present most of the Indian libraries are using off-line catalogue or manual catalogue, in which the catalogue are in card form and the end user can locate relevant resources by searching through cards.

7.3 Database Storage System

Database is a platform to keep computerised records. The overall objectives are to store data and to allow clients to retrieve and update that data on demand. It is broadly designed in three levels known as internal, conceptual and external level. It contains both metadata and static data. At the internal level structures of record are designed. While external level is user oriented in which, application programmer designs an interface for the client by using programming language. Conceptual level establishes link between internal and external levels.

7.4 Authority Control for Information Access Tool

Access rights or authority control for databases lie in the hands of the web developer or librarian. He has to decide the accessibility according to the category of end users. For doing so the librarian can provide user ID and password for authorisation according to the level of clients.

8. DESIGNING AN HYBRID SYSTEM

There is a practical approach to design a hybrid library system. As we discuss the requirement of hardware and software in architecture, it has to be understood that it involves continuous updation of data through backend to front-end. We may use a web server like Sambar, IIS, and Linux Apache etc. Here is an example to design hybrid system. Sambar Server is used to design seamless web interface. These servers have the facilities of www web server, ftp, telenet, mail-server etc. After installation, it will show some directories like lib, cgi-bin, docs, sysadmin, sysuser etc. In docs directory it gives index.htm file. You just replace it to your home page, and you open your Internet Explorer/Netscape browser and type your machine's IP address/name. Than your web server will start working. Now full text of data is mostly in .pdf, .html and .doc form. So as you will have to manage directories, and it should be in doc's directory. You just make a link in web page, for which you can use user-friendly software like FrontPage. Dreamweaver etc. There is a cgi-bin directory in which you can put bibliographical databases. It may be in MS Access, SQL and Oracle. You can connect Hard Disk tower and CD-net, in which data can be stored. There is a sysadmin directory, through which, you can handle system rights and configuration.

9. HYBRID LIBRARY IN INDIA

Indian libraries are facing lot of problems regarding automation and computerisation. Libraries in metros and class one cities are in better position. Different functional library networks are performing their active participation in networking of libraries and documentation centers. INFLIBNET is linking the Indian University databases. Delnet are bringing different Indian and overseas libraries databases on a common platform by the use of hybrid/networking concepts using Z39.50 protocol for sharing of resources.

In India few libraries follow the system like N.C.S.I., The databases created by Rajiv Gandhi University for Health Science, Developing Library Network (DELNET) are mostly on the web. JRD Tata Memorial library of Indian Institute of Science, Bangalore has established new milestones in the field of networking and digitalization.

Following Web Sites can link us to online database of libraries of different fields.

http://www.healthlibrary.com : Health Education Library is one of world's largest consumer health library. It contains free online full textbooks and journals. There is a facility to know about medicines and health services in India.

http://delnet.nic.in : Developing Library Network has been established for promoting resource sharing among member libraries. It compiles a central online union catalogue of books, serials and non-book materials of all the participating libraries. It facilitates different services for its member like Inter Library Loan and training etc.

http://www.inflibnet.ac.in : INFLIBNET is a library network created by the program of UGC. Its main objectives are automation of university libraries, database creation and networking of libraries. It is involved in online database creation of books, theses, serials and expert database.

http://www.library.iisc.ernet.in : Indian Institute of Science Library is one of the best libraries in the field of science and technology in India. It provides online database of journals, books, CD-ROM etc. Its full text electronic journals are available on the web.

http://www.iitd.ac.in/library : IIT's libraries are in better position in the field of science and technology. These are also available on the web and libraries have a large digital collection. The other IIT's library web sites are; Bombay http://www.ee.iitb.ernet.in, Kharagpur http://www.library.iitkgp.ernet.in, Madras http:// www.cenlib.iitm.ac.in etc.

http://www.cmmacs.ernet.in/nal/icast : National Aerospace Laboratory library contains aerospace database on web. Database consists of full text of electronic journals, contents of some journals, bibliographic database of books etc.

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54

The Role of Information Techonology in Power Delegation for Effective Management of University Libraries: A Feasibility Study.

M. RAMCHANDER*

ABSTRACT

This paper discusses the concept and categories of power, authority, responsibility and accountability. It highlights the process of delegation and principles of delegation. It describes what is communication and its role in power distribution. It also discusses the organisational structure and its different types. It illustrates the organisational structure in a University Library. It recommends the line and staff organisational structure for a university library with illustration. Finally, it describes the role of Information Technology in power delegation and the components of 'electronic office'. It concludes with a suggestion that the University Libraries in India must adopt power delegation in accordance with the organisational structure.

INTRODUCTION

The art of power delegation is to agree in clear terms of reference with the subordinates, to give them the necessary authority and responsibility and then to monitor their performance without undue interference or the continual checking of their work. It is also a matter of confidence and trust both in subordinates and in the manager's own performance and system of delegation. The first stage in planning the delegation is the clarification / defining the objectives and the design of suitable patterns of organisational structure to reach the said objectives. The manager should also know what to delegate, when, and to whom. Matters of policy and disciplinary

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power, for example, usually rest with the top manager and cannot legitimately be delegated. Above all, the delegation is a matter of judgement and it involves the question of discretion. Effective delegation needs good communication. Communication is not simply a tool, but it is the very 'life-blood of management'[1] of any organisation including library management. The manager as sender of communication, has three responsibilities, *viz.*, accuracy, brevity and clarity. The manager of any organisation including the University Library must ensure that message is accurate, and not approximate; that message is brief, not too long; and that message is clear and there is no ambiguity. Today, the use of Information Technology, especially, telecommunication technology is well received in day-today management of any organisation. Telecommunication services, such as E-mail, tele-conference, video-conference, facsimile, etc are used for effective communication and better power delegation among the staff working in the organisation. University Library Management also should take care of all these factors.

2. POWER DELEGATION

In most of the organisations, the possession of relevant information constitutes power. W.J. Buckley stated that power is "a specific mode of communication, a signal."[2] Power is the ability to do something. Managerial power is often measured by the ability to give, promise and withdraw rewards; inflict punishment; and fire subordinates. Such sanctions are common to all institutions, including libraries, and form the basis of power.

The managerial power can be categorised as:

(i) **Reward Power:** It is based on a subordinate's belief that the supervisor has the ability to grant rewards;

(ii) **Coercive Power:** It is based on a subordinate's belief that the supervisor has the ability to impose punishments;

(iii) **Referent Power:** It is based on a subordinate's desire to be identified with the supervisor and that person's power;

(iv) **Legitimate Power:** It is based on a subordinate's internalised belief that the supervisor has

the right to direct that person's activities; and

(v) **Expert Power:** It is based on the subordinate's belief that the supervisor has special knowledge and skills that make it reasonable that the supervisor directs the person's activities.

Mostly managers' power is a combination of these categories, usually with one or two of them dominating. When a manager has strong expert and referent power, the other categories are not of much concern. When expert power is weak, there arises the significant question about legitimate power. For example, when a person is appointed as a unit manager (section head / section in-charge) in a University Library without having a strong background in librarianship, there always seems to be a testing period during which the professional subordinates wait to see how much "expert" knowledge the new head has. If the professional subordinates find the manager (head) lacking in subject expertise, a power struggle usually results. When power is viewed in terms of the above five categories, it is not as dangerous or threatening as it might otherwise seem. Mere power is of no use. Power carries its value only when authority is given to exercise power. Therefore, the degree of power, is determined by the degree of authority available to the person possessing power. All organisations, including university libraries, are concerned with the distribution of power and authority within the organisation.

The authority is the right to do something and is associated with a position within an organisation. It may be considered as the power or right to act oneself or direct actions of others and to extract from them responses in consonance with the organisation's objectives. It means the power to command. The Head of the Library (Librarian) delegates to the subordinates (professional subordinates) power for the discharge of their responsibilities towards the assigned work. It is, however, necessary that the authority should correspond to the responsibility delegated. Therefore, authority and responsibility should be co-extensive and co-equal at all levels and well. balanced. When authority is exercised to delegate power of responsibility by the superior (Librarian) to the subordinate (professional subordinates), it automatically confers the

corresponding accountability on the subordinate in organisational relationship. It means, the subordinate is accountable or answerable to his / her superior for results. In other words, 'accountability' in management terminology, is assigning certain responsibilities to line and staff personnel, and in turn, holding them accountable for the achievement of predetermined objectives of the organisation.

In the light of the above, it is very clear that power, authority, responsibility and accountability are linked with one another. A delegation of authority is essential to achieve the estimated objectives of any organisation, including a big library where many sections are in operation.

3. DELEGATION – CONCEPT AND PRINCIPLES

In order to manage, it is necessary to manage the work of other people. This involves the process of delegation. In the case of a very small organisation or library, where one person does everything alone, the question of delegation does not arise. But as soon as additional members of staff are employed it is necessary to plan, organise, direct and control their activities. It is a fundamental principle of management that for organisational effectiveness there must be delegation[3].

To delegate means conferring authority from one executive or organisational unit to another in order to accomplish particular assignments (assigned tasks) for the achievement of goals. In other words, delegation is the process by which various parts of the total work and jobs to be performed and goals to be achieved are assigned to positions and to individuals who carry those positions. Hence, delegation is a product of the forces created by volume and complexity pressure, resulting from increasing volume of work activity. When work activities are grouped and classified, there come into existence units / sections / departments. No single individual in any enterprise is capable of handling all jobs necessary for the accomplishment of group purpose. Here, the necessity demands delegation of authority. The delegation of authority / power is the need of the hour for effective management of university libraries in India. The delegation of authority in the university libraries can be downward, upward or sidewise. It also depends on the type of organisational structure of the university library.

3.1 What is delegation ?

Delegation is the process of:

- Assignment of tasks, activities and responsibilities to subordinates.
- Transfer of authority so as to enable them to make necessary decisions, utilise resources and command others for performing the assigned tasks and activities and to discharge responsibilities.
- Extraction of accountability for adequate performance and for producing the desired results, and
- Setting up an adequate monitoring and control system so as to keep track of progress on assigned tasks, activities and responsibilities, measure performance and take corrective action.

3.2 Principles of delegation

The following principles will be useful as guidelines for effective delegation of authority[4]:

(*i*) **Principle of delegation in terms of results expected:** It clarifies that the authority which is vested in the managers should serve as a tool with them so as to obtain contributions to the enterprise objectives.

(*ii*) **Principle of functional departmentation:** It stresses on the development of functional departmentation in which various activities required to be performed for accomplishment of goals will have to be grouped.

(*iii*) **Scalar principle:** It explains that in the hierarchy of positions from subordinate to superior, there exists a chain of direct authority relationships throughout the organisation.

(*iv*) **Authority level principle:** It impresses on the point that, in keeping with the intention of delegation, the decisions with the authority limits should be made by individuals themselves. They should not be referred to upper levels of the organisational structure.

(*v*) **Principle of unity of command:** It envisages that in the chain of command subordinate should have to report to one superior only.

(*vi*) **Principle of superior's ultimate responsibility for acts of his/her subordinate:** It lays down that with the delegation of authority to a subordinate, responsibility of the superior does not cease. The superior still remains responsible and answerable for the acts of his/her subordinate.

(*vii*)**Principle of balance between authority and responsibility:** It is essential that authority and responsibility should correspond with each other. An individual who is assigned a responsibility, for which he / she is accountable, must be given appropriate authority for achieving better results.

Ultimately, the effective power delegation demands proper communication both upward and downward.

4. COMMUNICATION: THE LIFEBLOOD OF POWER DELEGATION

Communication is a process of putting minds into contact with one another, so as to obtain understanding, clarity, and exchange of information. The main purpose of communication in an organisation is to generate action, efficiency, good morale, and appropriate attitudes.

Any communication being a two-way process, involves a sender and a receiver. Sender has three basic responsibilities *viz.*, accuracy, brevity and clarity. The manager must ensure that message is accurate and not approximate; that message is brief; that message is clear; and that there is no ambiguity. On the other hand, the receiver, also has three basic responsibilities, *viz.*, attentiveness, bias-free, and complete understanding. Unless the receivers concentrate on the message—whether listening or reading,it will not register in their minds. Secondly, they must not allow any bias, or prejudice, to preclude their mind. Thirdly, they must ensure for effective communication, the presence of a fruitful organisational structure. It is essential, that the receivers have complete understandings of the message, and that any doubt they may have is clarified for which they must take the initiative.

Further, communication is of two types, *viz.*, oral communication and written communication. The first step in any oral communication—whether a telephonic business talk, or a friendly conversation face to face, or a formal meeting in an office, or an address from a pulpit-is to decide upon objective of

the message. The point is that there must be an objective. The purpose is not merely to speak, but it is to achieve something, to accomplish an action. Secondly, the message is to be formulated with a listener in view. The listeners interpret spoken message in two ways: (*i*) they ascribe an objective to the message; and (*ii*) they either take literal meaning of the words, or they ascribe a meaning other than the literal.

On the other side, there are three main forms of written communication in an organisation: Reports, Letters / Memos, and Notices[5]. A report is a communication containing some information from one person to another person who may want to use that information. A letter is a full-fledged, formal communication; whereas a memo is just an exchange of information. Notices form a common circular or communication meant for all subordinates in an organisation.

5. ORGANISATIONAL STRUCTURE IN UNIVERSITY LIBRARIES

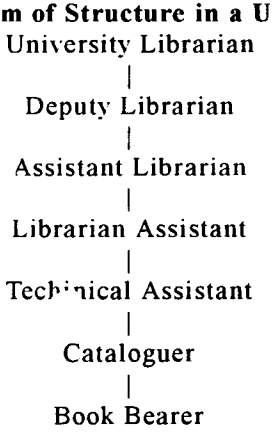
Designing of organisational structure is a process by which managers create a structure of tasks and authority. It is a composite of the sets of relationships between and among individuals and groups with the duties performed and authority exercised by these individuals and groups for attainment of objectives or goals forming the basis of this structure.

There are three types of organisational structure in practice. They are, Line, Functional and Line and Staff. It is very essential for an executive / manager / librarian to have clear conception of these aspects of organisational structure so that he / she may be enabled to delegate authority clearly and precisely.

5.1 Line Form of Organisational Structure

It is the claim of command, superior subordinate hierarchy of the organisation, that exists from the top down to the bottom level, that is, right from university librarian to bottom level staff in the library. It establishes recognised command relationship between superior and subordinate.

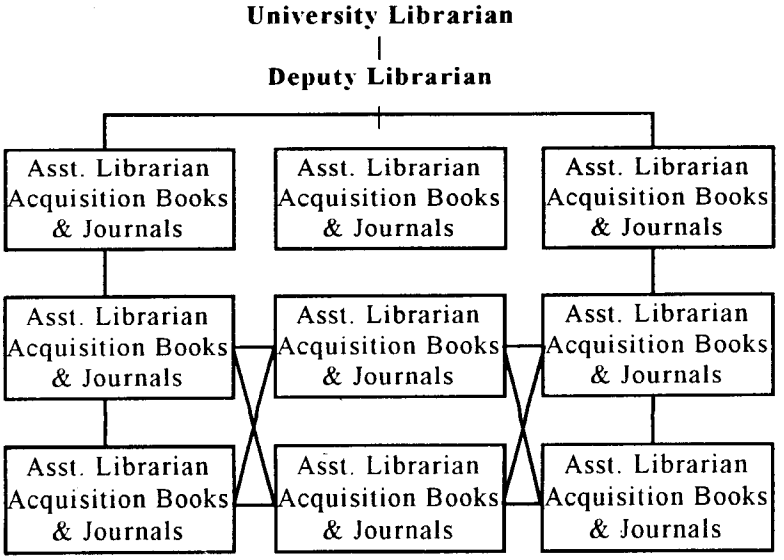
Figure 1. Line Form of Structure in a University Library



5.2 Functional Form of Organisational Structure

In the organisational planning process, the work is carried out on functional basis and each function is administered by a specialist. It is often called "functional foremanship". Here the subordinate staff is accountable to a number of superiors, the specialists.

Figure 2. Functional Form of Organisational Structure in a University Library:

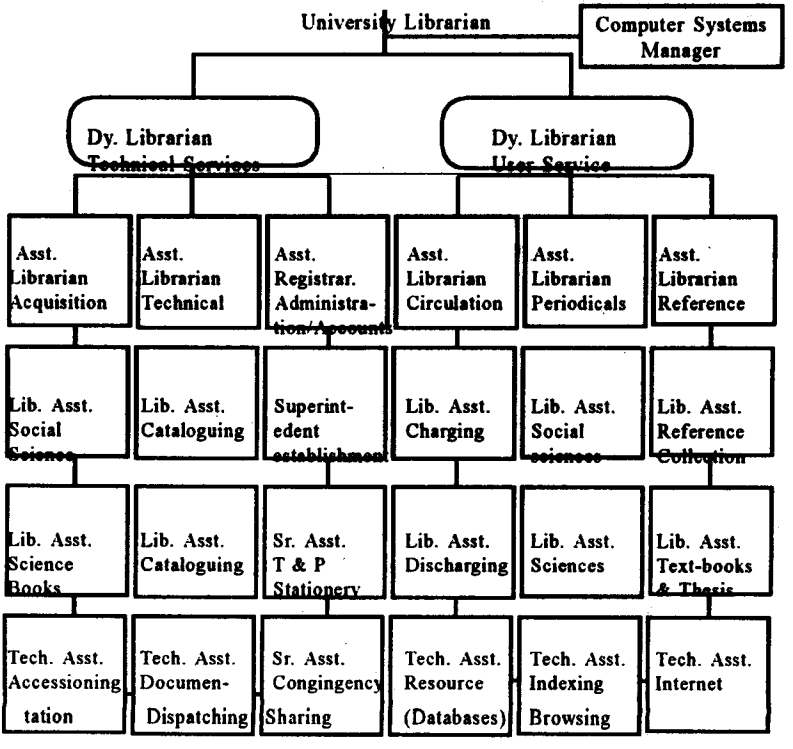


Hence every subordinate staff except those on the supervisory level reports to several supervisors. This is not much useful in the existing pattern of university libraries in India.

5.3 Line and Staff Form of Organisational Structure

This has the advantage of both the Line and Functional type of organisational structure. Here, the people in the line positions report to only one superior or supervision or section head, but they receive specialised services and help from various experts or specialists constituting the staff postions. The line positions comprise the library professionals performing the work of library operations and services at all levels. The role of those assuming staff positions is to provide support and advice for those in line positions. For example, the Computer Systems Manager will be in the staff position in a library. Proper balance is maintanined between all line and staff positions.

Line and Staff Organisation Structure of a University Library:



In India, most of the university libraries are practicing this type of organisational structure. In this, the Line and Staff' are jointly responsible for performance.

6. IMPACT OF INFORMATION TECHNOLOGY ON POWER DELEGATION

The emergence of Information Technology has brought, extensive changes in communication pattern. From a social point of view, information technology promises changes in the way people communicate and reach decisions. So also the developments in computer application and availability of tele-communication technologies, such as tele-conferencing, video-conferencing, e-mail, fascimile, and online search, opened new horizons in communication process, *i.e.* in terms of electronic communication both for individual and institute and society at large.

Information Technology made itself felt in the office much before the present push towards an "electronic office". The fast developments in Information Technology brought drastic changes in the management techniques in organisations. As a result Management Information System emerged in the field of management science. The management information systems are primarily aimed at lower and middle management by providing data to help with day-to-day organising, controlling and directing activities. Management information systems make use of electronic management aids; electronic diary; desk top and lap top computers, E-mail messages and remote conference facilities; mobile telephone (cellphone) and fax, etc.

The 'electronic office' which is the product of Information Technology has increased efficiency in power delegation through:

- Better use of executive resources requiring judgement, by automating the routine functions;
- Better communication;
- Increased ability to make sound decisions;
- Better use of time by making facilities available throughout day and night rather than office hours only;
- 'Extension of the walls of the office' to wherever the office worker happens to be[6].

Electronic office is a boon to the manager for effective

communication and management of organisation with fruitful delegation of power in all directions.

7. CONCLUSION

Power delegation generates the sense of oneness in the minds of subordinate staff. It develops the feeling that their cooperation and not mere compliance is essential. It increases the sense of responsibility, cooperation and coordination. Therefore, the University Libraries in India should go for power delegation in a systematic procedure through Line and Staff organisational structure using modern technology wherever required and achieve effective administration and pave the way for better services to its users.

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55

Networking of 'Information Houses' in India : An Ideal Model

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M KANAKACHARY**

ABSTRACT

The paper emphasises the viewpoint that application of IT and networking of so-called information houses (which include archives, libraries and museums) can greatly enhance the utility of their resources. In India, application of IT in information houses is limited. Of late, government has realised its importance. The best option would be to constitute a committee consisting of librarians, curators, archivists, computer specialists etc. The committee can prepare an action plan for networking of these information houses. National Archives of India can take a lead in this endeavour.

1. INTRODUCTION

The world, today, has entered the 'Information Age', because information has become a socio-economic product. Planners and policy-makers, and people in power who have to make decisions affecting large sections of society, are realising that information is the basis of gainful decision-making. Governments appreciate information as an instrument for social change and development. Economists have considered information as a non-depleting resource.

Such valuable information is available in different places like libraries, archives, databanks, documentation centres, clearing houses, oriental research institutes, museums, manuscript

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libraries and information centres. But, here, the authors have used the word 'Information Houses' which includes archives, Oriental research institutes, manuscript libraries, museums and libraries where the materials, particularly records and manuscripts are available.

Let us see the type of materials available in these 'Information Houses'.

A manuscript library, in addtion to different types of books, may have manuscripts on different material such as paper, paper leaves telemicro films.

The Archives may have written as well as printed records, maps, newspapers and clippings, film strips and microfilm rolls, etc. Archival materials are generated during the course of administration of the Central and state governments.

An Oriental institute, in addition to a variety of books particularly, the books of high rarity and out of print, may have illuminated manuscripts, palmleaves, birch bark manuscripts, and other manuscripts particularly handwritten etc.

A Museum may have clay tablets, coins, copper plates, stone inscriptions, parchments, leather scrolls, manuscripts etc.

A Library is an organised collection of documents such as manuscripts, printed books, serial publications and microforms or any other cartographic, graphic, audio-visual and electronic documents, available for use.

In India, it is estimated that there are about 100 premier 'information houses' and there is a tremendous growth of materials in these houses. All these materials have much historical and research value. Such valuable information needs to be processed and organised systematically so that the needy persons could access it very easily and quickly.

In information-inundated society, mere possession of one-time information will not be of much value, as new information would make earlier information redundant. Therefore, it needs to be updated from time to time as there is ever increasing growth of information.

In order to access such voluminous information very fast, there is a dire need for a network of all these ' information houses' in the country. Before forming a network, all these

'information houses' need to be automated with the application of IT.

2. BENEFITS OF THE APPLICATIONS OF IT IN 'INFORMATION HOUSES'

Before going for the application of IT in 'Information Houses', it is better to have a look at the benefits of the same. There are manifold advantages of IT application in 'Information Houses'. Some of the important benefits are mentioned below:

(*i*) In 'information houses, the same job is done many times. For example, the creator of the records/donor of the manuscripts, the period, the subject.etc., are required to be recorded in many different places such as acquisition section, records storage section, indexing section and so on. These routine and repetitive works can be done only one time through IT application and this saves lot of time and manpower.

(*ii*) Speed is more important in processing such information. Mountains of records/manuscripts etc. certainly need speedy processing. Even in retrieving the stored information, IT saves the valuable time of the information provider as well as information user. In this context, Dr S R Ranganathan's Law, propounded seven decades ago Save the Time of the Reader would become a reality. So surely, IT application in 'information houses' is quite necessary.

(*iii*) Another benefit of IT application in'information houses' is improving productivity. It is able to restructure the work, redefine jobs. It enables job-skilling and job upgrading.

(*iv*) The last but very important benefit of IT application is networking of 'information houses'. There are numerous advantages of networking. The main advantage of networking is resource sharing. In resource sharing, a user at a remote place can have access to the information scattered throughout the country.

(*v*) Bibliographical control of such rich information available in 'information houses' is possible on account of the application of IT.

If we look at the International level about the storage, retrieval and dissemination of the such information, many

countries have already applied IT in this field. Mr Sundara Raj (1499) has mentioned that various projects in this area have been planned in the world and many are in progress.

3. AN IDEAL MODEL IN INDIA

Of course, in india, the application of IT in 'information houses' is very much behind compared to the developed countries. However, now the government has recognised and realised its importance and started introducing IT in these areas. Though, application of IT in 'information houses' is little costly, it cannot be ignored. If it is ignored, the network cannot be formed, thereby resource sharing is not possible. Also our country cannot participate in universal networking systems in the world. This is a great loss and our country becomes information poor. Now, there are only two types of countries such 'information rich' and'information poor'. Information poor countries always march behind the progress in all sectors. Therefore, IT application is a must and this is the need of the hour in india. Some areas of IT application in 'information houses' are suggested below:

(*i*) Collection of records/manuscripts etc. from the government departments, voluntary organisations and individuals.

(*ii*) Indexing of the collected records/manuscripts etc. in convenient comprehensible manner to meet the requirements of the users.

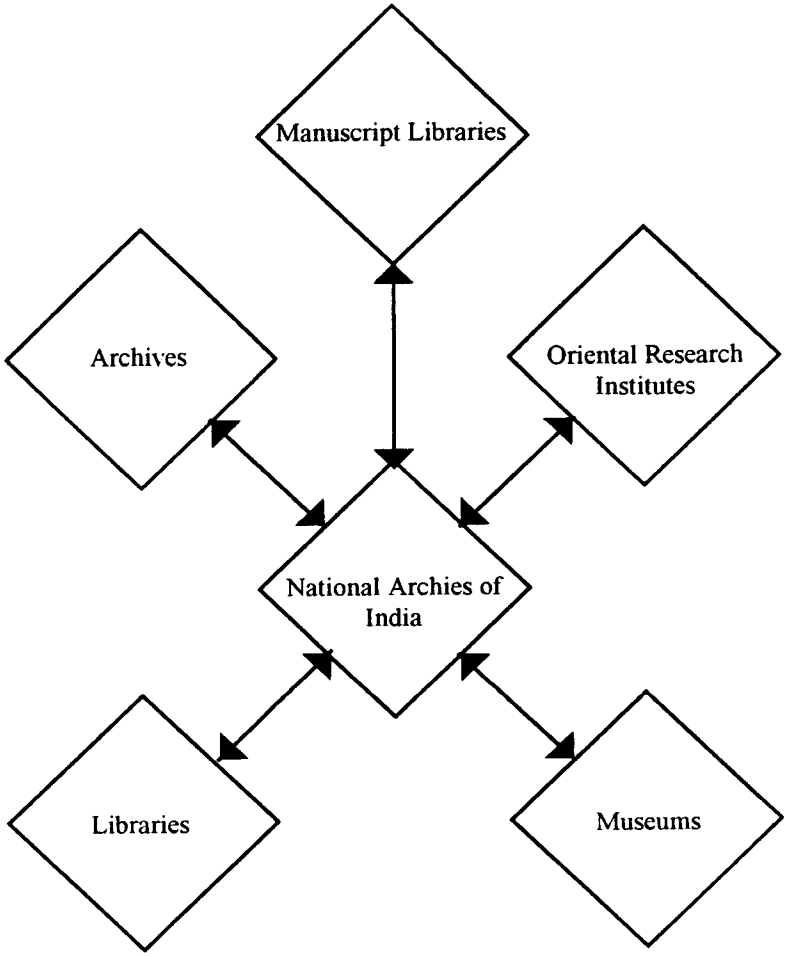
(*iii*) Producing the list of records/manuscripts etc, in any one of the ways like creator-wise/donor-wise, period-wise, department-wise, subject-wise and provide access points to them in different ways.

(*iv*) Generating lists of new records/manuscripts etc. that are added to the collections from time to time.

(*v*) Compiling union indexes (either department-wise or period-wise) of the materials of different 'information houses'.

(*vi*) Supporting the government departments by way of compiling statistical lists for taking right decisions and best monitoring.

For this purpose, and ideal model is suggested in a diagram enclosed.



An ideal model Networking of Information

4. CONCLUSION

For implementing this proposal, a committee consisting of some librarians, curators, archivists, governments representatives, scholars, computer specialist may be formed and the hardware, software, humanware and their training programmes, financial implications etc., may be worked out.

As far as the hardware is concerned, there are thousands of hardware vendors in the market and they may be contcted. As regards softwares, many user-friendly packages are available. However, it is suggested that NEWGENS DOCUMENTS MANAGEMENT SOFTWARE AND SCANNER is a good one, as it stores the data on optical media like CD-ROM and it enables storage of documents safely. efficiently and permanently. By using this system a single document can be filed in multiple folders and therefore can be accessed in multiple ways. It also helps in drastic reduction in search time using key words.

Some Archieves, Oriental institutions, libraries have developed their own softwares for certain activities. These softwares would also be made use of to the extent possible with mutual understanding. Whatever the cost may be, it is suggested there should be a network of all the 'information houses' in India for achieving the bibliographic control over the material available in them. It is also suggested that the National Archives of India should come forward and take lead a them task.

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56

Data and Knowledge Networking

B. RAVI*
N. VRATHARAJAN*

ABSTRACT

The paper explains the concept of knowledge networking (KN). The focus of KN is on transforming data and infromation into knowledge, and disseminating that knowledge effectively to the users. The success of KN will largely depend on involvement of scientists and engineers working in specific knowledge domains. However, diversity of data and multiplicity of sources make the task of data collection fairly complex, creating quality and integrity problems.

1. INTRODUCTION

Knowledge Networking is to support multidiciplinary research by employing the next generation communication network, associated information repositories, collaborative technologies, and knowledge management techniques to gather, create, distribute, use, and evaluate knowledge in new and secure ways. KN requires basic research on organising, distilling, securing, and collectively acting upon information. This requires dynamic distributed processes; methods for building and linking complex data structures, computations, and knowledge processes; and tools for navigating, gathering and displaying widely scattered and disparate inforniation. The focus of KN is on transforming information into knowledge and broadly disseminating that knowledge. Transforming and disseminating scientific knowledge

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will depend critically on the participation of scientists and engineers working in the specific knowledge domains of expertise and on the processes of scientific research in these domains.

2. THE GOALS OF DATA AND KNOWLEDGE NETWORKING

The main goals of data and knowledge networking are to under stand the fundamental processes through which knowledge is created, communicated, validated, and evaluated in the distributed systems of information, both natural and engineered.

It is also expected to improve the technical, social, educational and economic performance or knowledge generation and use, collaborative computation and remote interection.

3. NEW INITIATIVES FOR DATA COLLECTION AND KNOWLEDGE NETWORKING

Data quality is an important issue since quality determines the usefulness of the data as well as the quality of decisions based on these data. Data are frequently found to be inaccurate, incomplete, or ambiguous, particularly in organisational databases. The creation of new knowledgs in groups, organisations, and scientifc communities requires additional advances going much beyond the ability to collect, process, and transmit large amounts of data. Building upon the growing capability for connectivity, the Knowledge Networking initiatives are designed to support the creation and thorough understanding of:

(*i*) New forms of tools for data gathering, such as sharable remote instruments and large-scale web-based experimentation;

(*ii*) New ways of transforming distributed information into seamlessly sharable, universally accessible knowledge;

(*iii*) Appropriate processing and integration of knowledge from different sources, domains, and non-text media;

(*iv*) Useful communication and interaction across disciplines, languages, cultures;

(*v*) New tools and means of working together over distance and time;

(*vi*) Efficacious socio-technical arrangement for teams, organisation, classrooms, or communities, working together

over distance and time;

(*vii*) Cognitive dimensions of knowledge integration and interactivity;

(*viii*) Deepening understanding of the ethical, legal, and social implications of new developments in knowledge networking; and

(*ix*) Sustainable integration long term use and life cycle effectiveness of knowledge network;

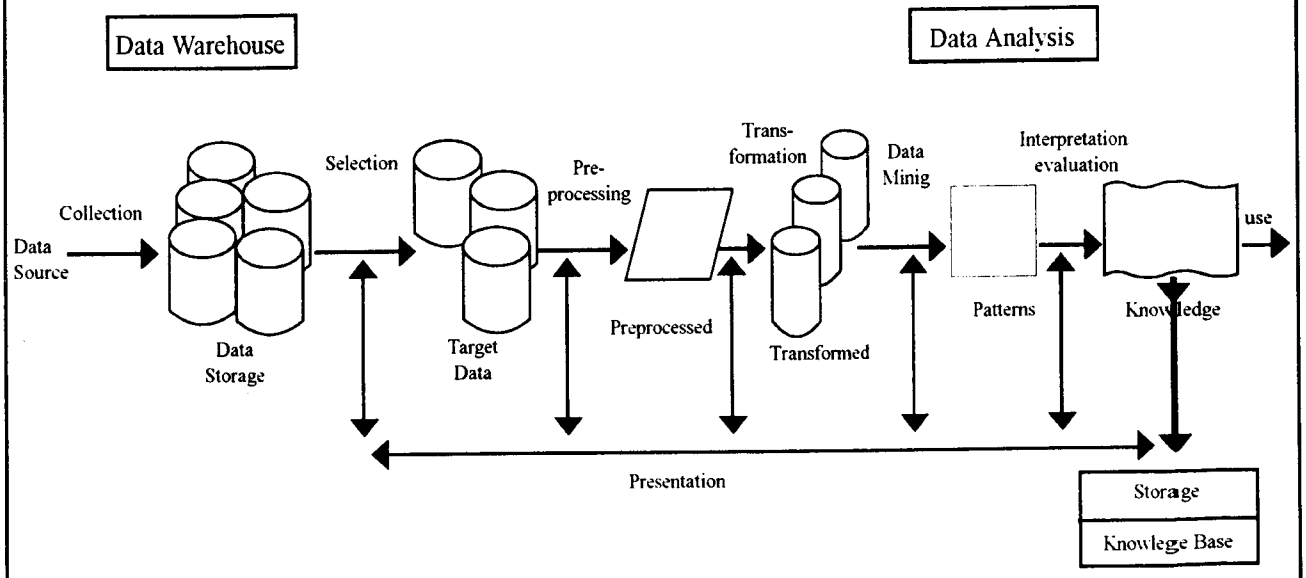
3.1 Difficulties of data Collection and Organisation

1. Since data increases exponetially; the past data must be kept for a considerable time,and new data has to be added rapidly
2. Data are scattered throughout organisations and are collected by many individuals using several methods and devices .
3. Only small portions of an oiganisations data are relvant for specific decisions An ever increasing amount of external data needs to be considered in making organisational decisions.
4. Diverse raw data may be stored in different computing systems, databases formats, and,human and computer languages.
5. Legal requirements relating to data differ from country to country and change frequently.
6. Selecting data management tools can be a major problem because of the huge number of products available.
7. Data security, quality, and integrity are critical yet are easily jeopardised unless the security system is planned carefully

3.2 Data sources and collection

Data can include documents, pictures, maps, sound, and animation and they can be stored and organised in different ways before and after use. Data also include concepts, thoughts, and opinions and can be ran or sammarised. The diversity of data and the mul tiplicity of sources make the task of data collection fairly complex by creating quality and integrity problems. Some times it is necessary to collect raw data in the field. In other cases it is necessary to elicit data from people. Raw data can be collected manually or by instruments and sensors.

4. DATA AND KNOWLEDGE LIFE CYCLE



The data life cycle begins with the acquisition of data from data sources. Data can include documents, pictures, maps, sound, and animation and they can be stored and organised in different ways before and after use. The transformation of data into knowledge may be accomplished in several ways. These data are first stored in databases, and later re-processed and stored in data warehouses. The data warehouse is a data repository that makes operational data accessible in a form readily acceptable for analytical processing. The data are organised within the warehouse as a relational database so that it is easily accessible to end users. To transform data into knowledge, the processed data may go through a transformation that makes them ready for analysis. The analysis is done with data mining tools, which look for patterns, and intelligent systems, which support data interpretation. Knowledge is generated as a result of all these activities. Both data, at variour stages during process, and knowledge, derived at the end of the process, need to be presented to users. Such a presentation can be accomplished by using different presentation tools. The created knowledge may be stored in a knowledge base.

5. CONCLUSION

The diversity of data and the multiplicity of sources make the task of data collection fairly complex, creating quality and integrity problems. Historically, data management has been geared to supporting transaction processing by organising the data in a hierarchical format. This format supports efficient high volume processing; however it is efficient for queries and other adhoc applications. Therefore, relational databases were added to facilitate end user computing and decision support. With the introduction of client/server environments, databases became distributed throughout organisations, creating problems is finding data quickly and easily. Knowledge networking is an essential component of most social relationships, ranging from families and friendships to companies, professional organisations and governments. Such social organisations play a critical role in sifting, selecting. organising, varifying, and vetting the information that becomes knowledgs. They also provide areas for actions that both manifest and communicate knowledge.

58

Collection Development Practices in IT Era

NISHAT FATIMA*

ABSTRACT

Modern libraries as service providers cannot afford to ignore the availibility dimension in the information technology era. This paper discusses the changes that CD-ROM, INTERNET and the DIGITAL LIBRARIES are driving at in the collection development practice. The paper also suggests the changes in libraries.

1. INTRODUCTION

Library is a social institution. It is expected to provide documents to all types of users whether teachers, general people, researchers etc. Thus we can say that the function of the library is to develop the collection in such a way that it meets the demands/needs of the clientele. The present environment is definitely IT based. The traditional way of development of collection is meaningless because much of the information we can access through various networks, and the clientele is fully satisfied. In this context an attempt has been made to discuss the collection development in the IT based environment.

Collection development means proper selection and organisation of documents keeping in view the future needs of the library. In a traditional library the collection constitutes books

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and periodicals, etc. In a modern library the resources are in print and electronic formats. But the changes in the publishing media are making selection process more complex. Libraries will have to adapt to the new changes.

Welsch opines that "simply duplicating the collection practices that are evolved for print in the networked environment does not seem responsive to current needs or capabilities."[1] The philosophy and approach to collection development must change. **Zhao** says that "a library is a complicated interdisciplinary system with its own specific features, requirements and problems"[2] aimed at providing **Dougherthy** further explains that "universal access to multiple resources in all possible media."[3] It implies that relevant collection required to serve the community, has to be developed and the collection should be made widely available, in order to provide information service. **Line** has well said "libraries should be evaluated in terms of services they provide rather than the collection they own."[4]. The collection development is the continuous process in all types of libraries worldwide. If a library does not add fresh materials to its collection, it would soon relegate into a dead collection affecting adversely the performance of a library. Naturally, collection development, as **Evens** puts "is a Universal process in the library world whereby the library staff bring together a variety of materials to meet patrons demands." [5]

2. IMPACT OF INFORMATION TECHNOLOGY ON COLLECTION DEVELOPMENT PRACTICES

In recent years, information technologies have advanced to such an extent that their impact on library is significant. Particularly, developments regarding digital libraries, Internet,electronic publishing, CD-ROMs etc., have forced the libraries to change the way they are now functioning. The financial constraints are forcing libraries to make use of the collection of other libraries rather than continuing with the practice of getting all the documents under one roof. This is possible through sharing of documents on the network. But this requires encouraging resource sharing and using documents which are freely available on Internet.

CD-ROM technology has come as a boon to libraries and information centres. In online access whether through dedicated line or dial-up mode or telex line there are three components of

cost. One corresponds to telecommunication changes. Second to computer connect time/database changes and third to online/off-line citation printing charges. These charges are totally eliminated in a CD-ROM system based access where only one time investment has to be made for acquisitions of archival database and updates for which are available at a vary nominal rate. Of course, investment has also to be made in buying the associated peripherals but the cost is considerably low as compared to recurring online costs. Often cost is a major factor to decide whether or not one should subscribe to CD-ROM database. The problem perhaps is of hardware and software. They change so frequently that one needs to worry about compatibility with new systems.

CD-ROMs are now increasingly being accepted as a standard storage medium. In near future there will be no need to subscribe printed media. If CD-ROM database are subscribed and made available on CDNET, many would access them from remote places.

Internet is perhaps the most exciting development taking place in the area of information technology today. It is a network of networks. In other words, Internet is a service, which facilitates the users to access information from different servers spread all over the world. Different computers from all over the world are interconnected to make the Internet network.

Network facilitates delivery and access of electronic journals and specialised materials. Much of what is available on Internet need not be procured. In this context libraries may have to review their collection development policy.

Libraries can also strengthen their collection through digital libraries. Digital libraries provide access to digital collections. Information content in digital libraries may include a combination of structured/unstructured text/numeric data, scanned images, graphics, audio and video recordings etc. There is a need to select acquire, organise, preserve and make accessible digital collections. Just as conventional library services, digital services must be planned, implemented, and supported. Deployment of digital libraries require integration of several information technologies many of these are quite often complex and advanced. But this does result in the availability of information

in networked environment. Resources like OPACs, in-house databases, locally mounted and/or remote databases created by libraries and other information centres electronic journals, newspapers and any other factual information can be made available on the network. With this the libraries can provide various network based information services.

In networked environment libraries have to develop the integrated collection. **Creth** claims that in the collection development, librarian will continue to do many of the things he or she is now doing, at least in the foreseeable future, but will also take on the new responsibilities. There won't be any dramatical changes in the approach of the collection development, but its role will be little different in the sense, libraries will also act as publisher and disseminators of scholarly information in a networked environment." [6]

3. COLLECTION EVALUATION PRACTICES

In traditional methods, collection can be evaluated on the basis of size of the collection, use of the collection by the users, number of volumes per document circulated and the cost of the documents. But all these measures are inadequate to evaluate a library in the context of information technology environment.

It is difficult to collect much if the data as perceived since users directly access information through terminals. In such a case we can only distribute questionnaire and collect data on how much is really accessed, number of records accessed/ downloaded, number of accesses to other electronic publications, response time, the cost of accessing, etc.

4. ROLE OF LIBRARIES AND INFORMATION CENTRES

In the changing scenario, libraries and librarians will continue to play an important role in handling traditional, conventional and electronic resources especially in a country like India where the print media is still very dominant. Librarians will have to recognise the importance of IT and adapt it in their operations.

Librarians have to play their role to identify resources that are likely to be of great interest locally and download the same to a local database and be the disseminator of information. **Aberico** comments that "Libraries may become publishers by using the network to build customized Multimedia documents

for clients or by providing the training and facilities to allow clients to build their own composite documents.[7]

To exploit the benefits of the networked information resources in providing information services, **Lancaster** has said that " the electronic resources at least remotely accessible do not need to be acquired, nor do they need any selection. Rather, the selection activity is of a different kind. Librarian select what to access to satisfy a known demand rather than what to purchase in anticipation of future demands."[8]

5. CONCLUSION

The collection development is one of the important activities in any kind of library. In networked environment its goal does not change but remains the same. IT has its own impact on collection development. It is necessary to monitor what is available on various networks. It may also be necessary to search frequently such networks and download the relevant records depending upon the local interest. It is clear that for libraries and information centres, IT is crucial as it has an impact not only on the organisational structure but also on the library's purpose and services. It is necessary that information professionals examine and design appropriate strategies in the selection and use of emerging technologies so as to increase productivity in library operations like collection development and management and also in enhancement of services to the users.

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59

Internet and its Use in Enriching and Upgrading of Information Resources in Academic Libraries in India : An Operational Strategy to Overcome the Problem of Financial Crunch

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MANORAMA TRIPATHI**

ABSTRACT

The paper deals with the utility of Internet and discusses the various tools available on Internet. It highlights the importance of Internet in today's era and dwells upon the relevance of internet in the world of academic libraries. Concludes that librarians of today do need to be net savvy for providing effective and efficient services to their clientele.

1. INTRODUCTION

The world has witnessed tremendous developments in the field of computers and telecommunications. The computer network technology has facilitated interconnection of computers not only within the country but also across the world. Today it is certainly possible to access any computer around the world connected to the network from any place. The first networks linking computers began to emerge as early as the 1940s. However, the present society has witnessed thousands of networks worldwide. Networks are divided into five types on the basis of their purpose and administration. They are: (*i*) *Academic Networks,* which are established normally with government support and the users of these networks are members of the academic and research community. These networks generally serve a region or a country. Under this category of networks BITNET in USA and JANET in the UK are worth mentioning; (*ii*) *Corporate Networks,* which are

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normally private networks with tight security to restrict access to authorised members of the organisation; (*iii*) *Cooperative Networks,* where the costs are supported by a group of separate institutions or individuals. FidoNet is worth mentioning as example under this type of network which has nodes in most countries of the world; (*iv*) *Commercial Networks,* which are available to the public at large or to closed user groups, on a fee-paying basis. Under this category AOL, an American network is worth mentioning; (*v*) *Metanetworks,* which are network of networks encompassing any or all of the above types. The Internet is a metanetwork which is a vast conglomerate of inter-connected computer networks that brings together people, information and computer resources across the globe.

2. WHAT IS INTERNET ?

Internet is a worldwide system of interconnected computer networks. The term 'Internet' specifically refers to the system currently based on the National Science Foundation's NSFNET network. The NSFNET connects several thousands networks thousands and thousands of computers in so many countries of the world into a global information resources. In the present era of information explosion, Internet has a tremendous impact on library services. It has revolutionised the information transfer and utilisation by providing universal connectivity. It has brought about global unification, in making the universe a true global village. Its potentiality is very vast and increasing both in size and complexity. The unprecendented growth of the Internet has made information more accessible than ever before, therefore, the entire universe is trying hard to enter the Internet arena. According to Notess[1] by the end of 1994 over 3.5 million hosts were connected to Internet and this number swelled to over 9.4 million by January 1997. NUA Internet Surveys estimated over 195 million hosts with Internet access in September 1999, with predictions of over 300 million hosts by 2005. Similarly, by now over 200 countries worldwide have access to Internet. Indeed, the growth in use of the Internet is so rapid that it is virtually impossible to quantify and it would not be wrong to say that the statistics become out of date as soon as they are produced or published.

3. GENESIS OF INTERNET

The genesis of Internet is traced back to 1969 with the beginning

of the APRANET (Advanced Research Projects Agency Network) by the military department of USA. It was connected to different defence research projects for building reliable networks. APRANET had protocols permitting dissimilar computer systems to interact through multiple paths using groups of data with their own destination address built in. The purpose of establishing such a network was to facilitate communication among researchers in the Advanced Research Project Agency of US Department of Defence. The four research laboratories connected on ARPANET developed in numbers so tremendously allowing several other research and educational networks being a part of it and accordingly this was referred to as the Internet[2]. Internet ranges from small Pcs to large corporate systems. It is a worldwide network formed by the cooperation inter connection of computing networks possessing global remote control in storing, retrieving and offering exhaustive and efficient service of large collection of information on any topic/subject of one's choice. In fact, Internet is now taking responsibility of controlling the problems like collection, organisation, storing and dissemination that are faced by the present day librarianship due to the information explosion.

The Internet today gives access to an overwhelming amount of information, data and electronic information services. Thus, Internet facilitates its users to:

- Exchange personal messages with colleagues, friends or relatives at other networked sites ;
- Engage in group discussions, exchange information and ideas with people who share a common interest, and seek information from them ;
- Automatically receive information on world events, leisure interests, technical business, and professional matters by subscribing to electronic journals, conferences, newsletters and alerting services ;
- Look up information in reference works, databases and libraries worldwide ;
- Retrieve journal articles, books computer programmes and graphic images and transfer them to a personal computer ;
- Make use of computer facilities that are not available locally ;
- Download new software or updates for existing applications ;

- Browse catalogues of goods and services and make credit-card purchases ;
- Participate in distance learning and academic conferencing ;
- Communicate with individuals or groups by means of voice or voice and image ; and
- Publish information for access by other Internet users.

4. NEED FOR THE USE OF INTERNET IN ACADEMIC LIBRARIES: SOME FACTORS

There are several factors that have compelled the academic [redacted] to choose the use of Intenet. Some of the major factors necessitating the use of Internet by the academic libraries are:

(*i*) Steep hike in the cost of publications—both books and periodicals, the devaluation of Indian rupee, increase in the conversion rates of foreign currencies etc. created a crisis situation in scientific communication, threatening to reduce access of faculty and students to new ideas in their respective disciplines;

(*ii*) In the past several years university and college libraries have been observing that the increase of budget for the purpose of books and periodicals is not proportionate to the increasing cost of the publications. Therefore, there is a big decline in their acquisition capacity;

(iii) Expansion of research and development activities almost in every field of knowledge has resulted in flood of scattered information which is so great that the user is no more in a position to have regularly and consistently all publications that may contain information of their interest. According to Kamath[3] in the field of Science and Technology alone about three million documents are published every year. Cohen[4] also has similar opinion about the information explosion and stated that two articles are generated in Sciences alone every minute. Thus, the rate of growth of information and knowledge is faster than ever before and it is still accelerating.

(*iv*) Multi-disciplinary research is an integrated feature of modern scientific enterprise which is a natural reflection of complexities, scale and cost of modern investigations. More and more scientific research is being attempted with intra-and inter-laboratory, intra-and inter-institutional and even

international collaborations requiring inputs on different aspects of various subjects. These factors create more and more demand on library resources and services which even highly developed research and technical libraries and university libraries dealing with research cannot afford to meet simply because they can not acquire everything that their users need. The solution, therefore, lies in opting for network and networking of the libraries;

(*v*) The demands of the users are not only increasing day by day but are also multilingual, multi-disciplinary, diversified and complex in nature. To meet this challenge, library professionals have already started utilising and exploiting the benefits of online and CD-ROM facilities. These facilities are certainly helping the libraries to enhance their information resources and provide information services to their users even for such material which may not be forming the part of their own collection. In this direction Internet is proving to be a big resource for them to handle their users with maximum level of satisfaction.

On the one side Internet can help the academic libraries in solving the above mentioned problems and on the other hand help the libraries in achieving Five Laws of Library Science enunciated by Dr. S.R. Ranganathan and also in achieving Lancaster's dream of 'Paperless Society'. While expressing the potentialities and capabilities of Internet, Neil L. Rudensting[5] stated "the library and Internet are being viewed increasingly as a versatile unified system providing an enormous variety of materials in different formats... The Internet and its successor technologies will have the essential features of a massive library system, where people can roam through the electronic equivalent of book stocks, with assistance from the electronic equivalent of reference librarians." Similarly, Quterman[6] and Yumba[7] lists the following advantages of Internet:

(*i*) Facilitates access to information stored on millions of computers worldwide without the danger of being 'shut out'.

(*ii*) Gives access to an array of online journals and database on various subjects and users ignore irrelevent materials.

(*iii*) Extends instantaneous transmission/receipt of E-mail message and files as several people can provide input at the

same time.

(*iv*) Facilitates book review that could enhance research and journal publications.

(*v*) Helps in distance education and other cooperative projects

(*vi*) Disseminates all kinds of data and information by keeping in touch with the latest development in various disciplines.

(*vii*) Developing countries can leap-frog using information in other countries.

5. INTERNET TOOLS

Internet is an information system and has made available its information resources through its connectivity tools. These are:

5.1 E-mail

This is the most powerful facility on Internet. A user who wants to use this facility needs to type his/her message and send it to the desired address anywhere in the world. Mail is passed from one machine to another instantly on the Internet and reaches the address. Messages can be sent or received in the form of text, graphics, images, photos, sounds etc. All mail systems, thus, should allow to : (*i*) edit a message offline before you send it, (*ii*) reply to one received, quoting text from the original message if desired, (*iii*) forward one to someone else, (*iv*) store messages for future reference, if necessary in folders or directories, (*v*) print messages, (*vi*) delete messages, (*vii*) create a mailing list to send a message to a group of people, (*viii*) send a file of text already created, (*ix*) save a message one has received as a file so that one can edit it, (*x*) set up an 'alias', which is a short form of address, for frequently used addresses.

5.2 Telnet

Telnet is Internet command used to make simple connection to a computer somewhere. It enables the users to acess online databases, electronic library catalogues and Internet information services. For example, for BIDS databases one has to type telnet bids.ac.uk OR for US government bulletin boards type telnet fedworld.gov. Though there is no complete directory of 'telnetable' resources but a useful route to many including, bulletin boards, library catalogues and databases, is Hytelnet at http:// www.lights.com/hytelnet

5.3 Gopher

Gopher software was developed to provide access to information on the Internet through a hierarchy of menus, but it has now been totally replaced by the World Wide Web.

5.4 FTP

FTP stands for File Transfer Protocol which is a system for downloading files from a remote site to our computer or uploading from our computer to a remote system. Thus, FTP requires specific address to the remote machine from where the file has to be retrieved.

5.5 Archie

It helps to find files that are stored in FTP server. FTP sites are regularly indexed by title and keyword and Archie searches these indexes by the file names.

5.6 Veronica

It searches for text that appears in Gopher menus. Veronica will ask a keyword and it then searches through the database and gets all the files matching the keyword and stores them on a temporary Gopher menu that user can browse through.

5.7 Jughead

An information retrieval system for Gopher using a search defined by the user.

5.8 IRC

A system for live conversation on the Internet which enables experts from all over the world connected by the Net to discuss a topic of Internet.

5.9 WAIS

Wide Area Information System is a full text indexing software that is used to index large text files, documents and periodicals. It allows the users to search text, sound or images from a single interface located anywhere on the network. It is appropriate for retrieving textual information. It provides a list of documents which are relevant to the query.

5.10 USENET

USENET (also known as Netnews) is a global conferencing system. It is also called as Bulletin Board System (BBS). TILENET provides a complete listing of all USENET newsgroups inlcuding a short description of each one. USENET groups are arranged in topical hierarchies like biz, com, rec representing business, anything to do with computers, games, sports and hobbies respectively. As per an estimate there are over 30000 newsgroups available and the number grows daily, covering leisure interests as much as academic subjects[8].

5.11 WWW

World Wide Web is an Internet browsing and information retrieval system that uses a system called hyper text to link one document to many other. It is now the predominant way of using the Internet. It provides access to a variety of Internet resources from the same interface, including FTP and Usenet newsgroups in addition to Web sites.

6. INTERNET: A BOON FOR THE ACADEMIC LIBRARIES IN INDIA

Academic libraries in India can really be beneifted with the tremendous information resources available on Internet. Internet, through its connectivity tools facilitates libraries and information centres to access latest huge information resources. Following advantages can be accrued from Internet:

(*i*) Academic libraries can use Internet for the purpose of building of library collection. A library can send the orders directly to the publishers online by utilising the service extended through TOC (Table of Contents). TOC of books and journals are available by different publishers free of cost. Elsevier, Pergamon Press, Academic Press, Blackwell, John Wiley-VCH, Marcel & Dekker Inc., Springer-Verlag etc. and many more Society publications provide this service on Internet. Online Table of Contents of so many journals are also available. For example, Science Direct, which is made available on Internet by Elsevier contains over 1000 journals in Life Science, Medical Science, Physical Science, Technical and Social Sciences. Blackwell provides UnCover service which is a database of current articles containing about

17,000 multi-disciplinary journals. Thus, Blackwell publications can be ordered through Internet on the Web address http: // www. blackwell. co. uk/bookshops. Amazon Bookstore, USA can be looked into to search a collection of more than three million titles by author, title, subject keyword, ISBN, etc. It provides access to 32 cities in India that have access to the Net . Similarly, on a website like http://www. com offers a list of 2,00000 titles. These are monthly guides to select new books.Likewise, a website www.ciol.com is maintained by the Dataquest which gives information on technology. It links to IT magazine set list of IT related events, news etc. Undoubtedly, with the use of Internet, the job of acquisition librarian has become much faster and easier, reducing the correspondence work substantially. Earlier, ordering for foreign publications directly from publishers used to take four to six months. Now it can be made available within a period of eight to ten days.

(*ii*) Quite a large number of research, academic, public libraries all over the world have their catalogues available online. It offers a communication link to libraries which have online public access catalogues and derive the benefits out of this facility. For example, the U.S. Library of Congress has made available its catalogue on Internet and facilitate libraries all over the world to utilise and exploit its large inforamtion resources for academic use. As the catalogues of the institutions like LC and OCLC are in conformity to international standards such as MARC format, standardisation and uniformity can be achieved. Thus, academic libraries can make use of this facility to achieve standard in technical processing of the documents.

(*iii*) Through Internet Online Public Access, catalogues can be used to see the collection of different libraries worldwide. Hence, access can be made for a particular book and the same can be got reserved and requested online using Internet facility. Similarly, photocopies of the relevant articles can be requested online by connecting to their website. For example, The British Library's Catalogue is available at http://opac.bl.uk which covers books, periodicals, reports and conferences in all its libraries from

1980. Similarly, COPAC already gives access to the combined library catalogues from eleven universities, including Cambridge, Edinburgh, Glasgow, Leeds and Oxford, with the catalogues of a further twelve to be added.

(*iv*) There are numerous reference sources available on Internet. For example Encyclopaedia Britannica Online (http:// www.eb.com/), McGraw Hill Encyclopeadia of Science and Technology 18th ed.(http:www.nah reference. com/ EST.html), Webster's Dictionary (http:11 gs 213. sp. cs. cmu. edu/prog/ webster), Roget's Thesaurus (http: //www thesaurus.com/) etc. can be used by the librarians to meet the information requirements of the users.

(*v*) Information explosion era has made resource sharing programmes indispensible where Internet is being used tremendously. Through Internet users of one library can know what is available in the collection of other libraries. It creates a cooperative network that is very useful for the libraries passing through financial crunch. To participate in such programmes, libraries on the net make their resources available on the net to be used by other libraries. Similarly, CAS and SDI services can also be provided more effectively to the users by using Internet and its huge multi-dimentional resources.

(*vi*) The students like to access a wide range of information on various subjects and even admission procedures etc. to various courses in academic institutions through online search. This information can be made available to them through Internet. For example, by searching NISS Information Gateway (*i.e.* http://www.niss.ac.uk) which is a government-funded information service for higher education. It has material on the working of education, educational policy etc. from government departments and agencies, higher-education information services, school-performance tables, courses and conferences. It offers much information for day-to-day use such as: (a) addresses of universities and other institutions, (b) research databases and other sources, (c) job vacancies, (d) reference sources such as dictionaries, e-mail directories, yellow pages, maps, (e) financial information, (f) electronic newspapers and magazines, (g) library catalogues, (h) software, (i) collections

of Internet resources are arranged by subject. It may also be useful for information pertaining to textbooks, general collections, specialist collections etc. For example, one can access some general collections like OXFORD TEXT ARCHIVE by having a web site address http://ota.ahds.ac.uk; Internet Public Library Online Texts with http://www.promo.net/pg; online books with http://www.cs.cmu.edu/books.html; and Centre for Electronic Texts in the Humanities with http://www.ceth.rutgers.edu and specialist collections like British Poetry 1780-1910: a hypertext archive can be searched with http://etext.lib.virginia.edu/britpo.html and so on. Similarly a reader can be benefited by the Internet resources by providing information pertaining to research papers, bibliographies and databases, subject dictionaries and encyclopaedias, maps, numerical data, electronic journals etc. For example, Academic Press have 170 journals from 1996 onwards at http://www.europe.idealibrary.com and the Institute of Physics provides its journals at http://www.iop.org. Thus, any user can look at articles and an abstract, but full text copy can be obtained only when the library has a licence agreement. In addition, information gateways such as SOSIG (http://www/spsog/ac/uk./) a Social Science information gateway gives an authentic source of selected high quality information for researchers, professionals in social sciences, business and law professionals. PICK (http://www.abcr.ac.uk/tylwww/e/) is a subject gateway for librarianship and information science resources. A notable feature of this site is the facility to browse the resources by the DDC. BIOME (http://biome.ac.uk/biome.html) is a subject gateway basically tuned to the needs of the academic community in health and life sciences. Alex (http://www.infomations.com/alex/) gateway contains information on full text digital documents avaialable in the public domain on American literature, English literature and Western philosophy. Similarly, Biz/ed (http://www.bized.ac.uk) is a gateway of information that aims to serve the needs of students, teachers, and researchers of buisness studies and economics. ADAM (http://adam.ac.uk/index.html) is information gateway for people looking for information on art, design, architecture and media.

(*vii*) In addition, Internet can also be used for providing information on course material with a specifically educational role that gives a structured and guided view of a topic. For example, Internet can be used for gethering information on lecture notes, case studies, summaries, illustrations, videoclips, animation, tests, simulation etc. Typical example in this respect are online biology book which can be accessed with a web site address http:// gened.emc.maricopa.edu/bio/bio/bio181/BIOBK/ and also with BioBookTOC.html. Similarly, on subjects like teaching and learning there is material on the WWW at Maricopa Community College at Web site http:// www.mcli.dist.maricopa.edu/tl/index.html etc.

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60

Digitising Library Collection : Best Practices in the Indian Context

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ABSTRACT

Digital library development and digitisation of local collection are getting increased attention these days the world over. The Indian libraries are facing a severe handicap in this context as content, the key element of these ventures are either copyrighted by commercial publishers or those copy-right free are present only in printed from. In the national scene, one should also experience the presence of a large quantum of knowledge transferred through generations only in oral form, and to preserve this one knowledge also requires proper mechanisms for its record as well as smooth dessemination in electronic form. When we compare the situation in a large number of academic and special libraries in the country, though they have a considerable amount of local contents, the efforts to digitise them are meagre due to various factors of infrastructure, manpower, finance and lack of priorities. This paper tries to identify the key issues for an Indian library to digitise its collection, and the best practices that must be utilised to achieve the unachievable target.

1. INTRODUCTION

Digitisation in the library context may be referred to as the conversion into digital form that part of the collection presently available in analog form such as paper, microform, audio or video tapes. This may be achieved by a variety of routes like keying, scanning done either inside the library or contraced to outside agencies, or when available going for procuring only in electronic

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form. As digital libraries and the various issues involed in developing them will be difficult to summarise in a short paper, here emphasis is paid only on various aspects of digitising library collection. Most of the digital library projects dealt with making prototypes to demonstrate the viability of the digital alternative. Here we will be dealing with how to surpass such prototypes and doing hardcore development in relation to the massive and resource intensive digital transformation of tangible resources into electronic form. There are digitisation projects undergoing at least in libraries in developed countries. Fox et al. detail the path-breaking developments in providing digital access to theses and dissertations through the National Digital Library of Theses and Dissertations (NDLTD) (www.ndltd.org) at the Virginia Tech. USA[1]. Due to various constraints in digitising library collection which will be discussed in the later part of this paper, most of the libraries where digitisation projects took concrete shape, identified and included only certain part of the collection for conversion. There are such projects to convert antique books[2], music[3], images[4] or special collection[5,6]. Gunter discussed about the METAe project (http://meta-cuibk.ac.at/newsletter.news.htm) at the University of Innsbruck, Austria, which is a collaborative research and software development project to develop application software for the digitisation of printed material. The basic objectives of the project include cost-effectiveness and degree of automation; structural metada to capturing; and digital preservation by producing highly standardised information objects[7]. Another aspect to be discussed like digital library development when one deals with digitisation of library collection is the tedious task of digital preservation. In this discussion we do not deal with this aspect as only when our libraries have sufficient amount of digital materials, then they may be able to understand the seriousness and to devise action plans to address the issues of digital preservation[8-11] in the right perspective.

The term 'best practices' is often used to designate such practices often deemed as path-breaking from the ones normally followed.. Nowadays these terms are also getting much attention in the manufacturing and services sector to follow the quality regimes proposed by ISO. In the context of social programme, USESCO's MOST Clearing House defined the Best Practices[12] which can be employed for other service sectors such as library

operations and information services by slightly rephrasing them as follows:

- Are Innovative : A Best Practice develops new and creative solutions to common problems.
- Make a difference : A Best Practice demonstrates a positive and tangible impact on groups or communities concerned.
- Have a sustainable effect : A Best Practice contributes to sustained eradication of problems, especially by the involvement of professionals.
- Have the potential for replication. A Best Practice serves as a model for generating policies and initiatives elsewhere.

While there are traditions of stewardship and best practices instutionalised in the print environment, many of these traditions are inadequate, inappropriate or not well known in the digital environment[13]. As digitisation programes are not available or nascent in our libraries, there is no doubt that whoever venturing into this crucial task has only foreign models, and they have to innovate a lot to adapt them to the local context. Any attempt in digitisation will no doubt makes a difference by providing improved, enhanced and integrated (collection which cannot be combined in other forms might be hyper linked after digitisation) access to such contents. It is not just for the fun of digitisation or not for merely improving the status of library, digitisation projects are undertaken. The information technology (IT) intensive research, teaching and information and communication environment does enough to sustain the digitisation efforts enabling more and more libraries to enter into such developments. As is the case with other aspects of professional development, ideal digitisation projects definitely get more visibility and attention forcing others to look into possibilities for their replication. With this background of digitisation and best practices, let us address the more crucial issue of why, what and how to digitise along with its problems and prospects.

2. WHY TO DIGITISE ?

Digital has become the order of the day due to the significant advances computer and communications technology have brought in the post-Internet information age we ae living in. Libraries are not lagging behind other social service institutions in exploring

the new technology available at any point of time to improve information organisation and services. This can be amply justified by the use of non-paper media like microforms to archive less / selectively used materials. Comparing average times spent on reformatting, it has been found that digital conversion needs less time during the conversion stage and more time both in the pre- and post conversion stages than for photocopy and microfilming[14]. Computer application in India for library work has a history of at least three decades. This is being said because just at the time computer entered our important academic institutions and selected R&D facilities, it was also explored how it could be used for improving information processing and management. Initially depending on the institution concerned and the time and support the computer resources could be rendered for library tasks, stand alone programs were made to achieve tasks like current awareness services or catalogue card generation. Also the online information revolution that followed attracted at least few of the mighty institutions to try their bit to use such resources for solving local information requirements. Then the dsitribution of the content of online data respositories in CD-ROMs made it affordable for a large number of institutions to use these databases. In the case of online as well as CD-ROM database usage, attempt was only to use electronic data available elsewhere to satisfy the information needs of clients. Another parallel development on this count is the availability of cheap public funded packages such as CDS/ ISIS or commercial packages at affordable rates for automating the house keeping operations of library. Indian libraries felt the need for such packages widely regarded as 'Library automation packages / software' as they largely help to achieve the routine tasks of procuring, processing and circulating books and handling subscription, arrivals and binding of journals efficiently in a time saving manner. The interest and importance these softwares attracted among our libraries is amply demonstrated by the avialbility of a wide range of such packages on different plateforms and operating systems to suit different types of libraries. The 1980's saw more and more libraries using computers and the last decade augmented this rate further. The spread of Internet and Web in particular made available a large chunk of electronic contents, most often freely for unhindered access. Subsequent to this development, at least in developed countries, there were

introspection most often from the computer community to generate as well as disseminate large quantum of digital contents in a more organised fashion as in a traditional library. The library community also jumped into the bandwagon to develop various digital library initiatives, thanks to the significant chunk of project support available. Thus, as is the case with explorations in computer use for library work, or the application of online CD-ROM systems for information search and support, or the adoption of library automation systems, or the use of Internet for hosting library web-sites or using web resources for refining operations, the next step in development is viable and serious attempts on digitising collection and to enter into local or collaborative projects in digital library development. Coupled with this is the presence of substantial amount of local contents, especially in our academic and special libraries. Though contents in the traditional sense such as journals and books were copyrighted by commercial publishers or outside agencies, efforts to digitise at least the local contents are meagre due to various factors of infrastructure, manpower, finance, and lack of priorities. Users have general expectations that digital products include greater functionality, more rapid delivery, more value for cost, cross-publisher databases, streamlined licensing agreements, ability to identify fragments of content, and clear understanding of any limitations[15]. The four assumptions of resource sharing, lower maintenance and distribution costs, meeting user demands for timely access, and continuing value of information presume that electronic files will have relevant content and functionality[16].

The digitisation projects—ongoing and the ones in the planning stage—are no doubt driven by the information needs entwined with the ever penetrating computer technology. Further, the real question of "to be or not to be" for digitising library resources would find justifications in:

(*i*) It is not only the availability of digital technology that is important but the point to be stressed is its affordability with each significant improvement in the technology driven by market forces.

(*ii*) Digitised materials can be easily searched and retrieved that will definitely augment their use.

(*iii*)Resources digitised could be easily shared among members

of the library network or consortia. If each library does its bit to digitise even part of the collection, the ultimate result will be considerable for sharing among different members.

(*iv*) Even if the full text is not available outside Intranet or members of the consortium, mere search and inventory facilities over the Internet itself will significantly enhance the image of the library and its better visibility among other similar facilities.

(*v*) Less likely to be damaged than print counterparts, as they have no physical form to yellow and decay with age, and loaning out a copy does not relinquish the original[17].

(*vi*) Require less space for storage and hence reduction in the building space required.

3. WHAT TO DITISE ?

Chapman and Kenney suggested that the source documents themselves as the focal point for conversion decisions and not current user needs, current service objectives, current technical capabilities, or current visions of what the future may hold[18]. The US Task Force on Archiving of Digital Information, established by the Commission on Preservation and Access and the Research Library Group[19], found that many of the criteria librarians have used to archive print content apply equally well to digital information:

- appraisal of the subject and discipline in relationship to the institution's collection goals
- the quality and uniqueness of the content
- its value now and for the future

Any library must identify two types of sources for digitisation as per their use characteristics. Sources always in high demand in less number of copies may be the obvious choice. There may be sources less used, as they are difficult to be handled in the present form and could be digitised if that will lead to more use of them. The acute problem while pondering over library digitisation is the crucial question of copyright and intellectual protection involved for most of the library materials. Libraries subscribing to a journal or buying a book are entitled for certain rights to put these materials to "fair" use of its clientele. Publishers and other copyright owners may turn a blind eye to photocopying a few pages from them for classroom use or for research work. The so

called virtues what we attach to digital technology like ease of use, modification and distribution are treated as threats to their rights by the copyright owners. Whatever security and safeguards ensured to protect the use exclusively for authorised user community can be easily broken by others as technology centric precautions will stand only till a person better in technology than you. More over the publishers do not ease their rights to others as they themselves are engaged in a digitisation plan of new publications and in some cases even retrospective materials selectively.

Thus our libraries are left with a choice of digitising only a few materials. But an ingenious action plan will enable us to even find three types of materials as per copyrights involved, *vis.* a lot of such materials that are copyright free, copy right owned, and copyright transferred or bought. Copyright free materials belong to those in the public domain like government documents or old books for which the copyright is either expired or not enforced. Since these materials are old or easily availbale, care should be taken to first identify the usage rate of them from statistics generated by library automation package. Only the maximum used ones are to be digitised. A less used one is to be digitised only when it is demonstrated that difficulty in handling in the present form is hindering its use. Since our publishing industry is not as streamlined as in developed countries, one can see a lot of publishers go into oblivion after publishing a handful of titles. As they may be willing to transfer the rights for local digitisation, this is one way of copyright buying in individual libraries or consortia without spending much. Other means of buying the rights will be a very difficult proposition at least for our libraries as funds are always on the decline whereas sources, users' demands and prices are always on the uphill.

One could see a large spectrum of copyright owned resources both formal and informal most often the result of in-house intellectual output at least for important academic and research institutions. They fall under the following categories:

- *Pre-prints of research papers:* These are the first or unedited draft of research publications sent to formal forums like journals, conference proceedings, and edited books. Some may argue that they violate the publisher's rights or the publisher may not accept papers in future. Since information

dissemination should take diferent forms, there is enough ground to argue for the intellectual property vested on the authors and their institutions to uphold the rights for selective dissemination of preprints.

- *In-house reports:* The institution affiliating the library may bring out different reports to update and inform about in-house research or such occasions like annual reports, convocation reports, etc. There may also be reports at regular intervals to signify or highlight the research and development or consultancy projects undertaken.
- *In-house publications:* These may be copyright owned publications brought out by the different departments of the institution concerned.
- *Conference Proceedings:* Proceedings of conferences hosted by the institution and friendly institutions.
- *Theses and Dissertations:* There may be many theses which continue to remain unpublished and their reach and use would be enhanced by digitising them. Traditional methods of archiving and storing theses and dissertations are inefficient, unwieldy, and not efficient to locate the information contained, and the time and costs involved in procuring copies are prohibitive[20]. During the 1996-97 academic year at Virgina Tech, Electronic theses and dissertations (ETDs) were accessed "almost two orders of magnitude more than the number of circulations of the library copy"[21]. Even the theses and dissertations available from UMI are supplied currently only on paper, microfiche, or microfilm[22].
- *Informal Sources:* such as lecture notes, notebooks, manufals, correspondence with eminent personalities, question and examination papers.

The above list is merely indicative and there may be many other sources owned by institutions that can be identified and included for digisation. To have a feel of the treasure of materials available, a brief estimate of the output from a national level academic institute, IIT Kharagpur with a possible number of other similar institutions and their estimated output collected from different sources is shown in Box 1. The importance of these items for digitisation is especially stressed because they normally end up in an information distribution channel or when formally

published in limited copies most often by the institution itself or an amateur publisher without any professional distribution channel. They are to be tackled very seriously as they are the major quantum of materials at our disposal to make the library's presence in the digital arena. This is also important from the purview of identifying and conserving the intellectual, research and publishing output of the country. If any institution is willing to digitise and provide enhanced access, there is no dearth of many other institutions willing to offer similar contents owned by them.

Box 1 : A Brief of National Research Output in Science

Publications from IIT Kharagpur[23]

Degree Programmes: Undergraduate 22, Postgraduate 52

Each of these programme has around 10 – 40 courses and an approximately over 1000 lecture notes.

Over 32 of these courses are video recorded and available as 900 video cassettes of 1 hour each.

Annual Output

Preprints of publications in Journals : 517

Preprints of publications in Conference Proceedings : 395

Conferences or short-term courses organised : 60

Ph.D. Theses : 100

M.Tech dissertations : 325

Sponsored projects : 65

Consultancy projects : 130

National Count

Total Number of Univerisities in the country[24] : 248

R&D firms[25] : Central 384. State 713, Public Ltd. 138, Private Ltd. 1088

Research publications in about 4000 Science Citation Index Journals (12 Indian)[26] : 12030

Research Papers published[27] : 16949

Number of Indian Scientific Journals : 1546 (as per National Science Library Brochure)

Number of Indian Scientific Books in 1994[28] : 1830 (out of the total of 11460)

Another matter of grave concern is the encroachment on our intellectual property, notably on poorly documented traditional knowledge through bio-patenting. They are largely transferred orally over generations or preached and practiced exclusively in the 'guru-shishya' mode. Thus the need for better documentation and proper inventory of such resources are regarded as significantly important. There are also materials related to spirituality, epics, traditional systems of medicines, and local forms of craftsmanship or artistry. Some of our libraries have rich collections of these types of materials, which are not disseminated in the pesent form, to the desired extent among deserving users. Perhaps digitisation of them will enhance their use not only at the local level but also to a larger audience spread throughout the country and may be abroad too.

As a solace to the purchase of printed sources, the publishers offer some electronic enhancements and any library entering to digitisation should first begin to envolve methods to tackel these e-supplements. The experience on providing access to these digital items enables the library enough acquintance to provide services to digitised materials later. This category of materials fall into two types:

- *CD-ROMs / Floppies accompanying books* : International titles in Science and Technology, and Computer Science in particular come with CD-ROMs and floppies containing computer programs or demonstrations of materials discussed in the printed text. Some of the libraries keep them in the Computer Section and sometimes provide access through a stand alone PC. Information about the availability of them will be marked in the library Online Public Access Catalogue (OPAC) too. But this mode of access is mostly static, as only a curious and persuasive user would get access to them. The ideal mode of access is to make these materials available on click and access mode through a CD-ROM / mirroring server.
- *Electronic Journals:* It has become common for international journals from non-profit organisations or societies as well as commercial publishers to offer subscribers electronic access through the Web free or for a small surcharge on the subscription fee. There are such options for access from several of them and the ideal place to look for them is their

Web sites or the subscription invoices / agreements. Elsevier Science Press through its Science Direct (www.sciencedirect.com) provides free abstract search for all and paid full-text access (free for subscribers) to its entire spectrum of journals on various branches of science and technology. IDEAL from Academic Press (www.idealibrary.com) and LINK (link.springer.de)from Springer-Verlag are similar examples. An ideal demonstration of how to serve electronic journals is seen at the digital library (www.acm.org/dl/) of the Association for Computing Machinery (ACM). The Central Library of IIT Kharagpur has been able to provide on-web access of at least 600 of the 1000 plus journals subscribed.

4. HOW TO DIGITISE ?

The Universal Library Project of Carnegie Mellon University providing free web viewing of antique books (http:/// www.antiquebooks.net/) argues 600 dots per inch image capture for the letter press books grant enough visual accuracy to render print imperfections in a satisfactory, if not completely accurate fashion[29].The Colarado Digitisation Project (CDP at http:// colaradodigital.coalliance.org/) cautions the following[30]:

- Scanning at the highest resolution at an appropriate level of quality to avoid rescanning and re-handling of the originals
- Creating and storing a master image file
- Using system components that are non-proprietary
- Using image file formats and compression techniques that conform to industry standards
- Creating backup copies of all files on a stable medium
- Creating meaningful metadata for image files or collections
- Storing media in an appropriate environment
- Monitoring and recopying data as necessary
- Outlining a migration strategy for transferring data across generations of technology
- Anticipating and planning for future technological developments

The Department of Preservation and Conservation in the

Cornell University Library[31] created 1 million digital images in the past few years framed a set of working principles to govern the conversion of research collections into digital image form:

- digital conversion efforts will be economically viable only if they focus on selecting and creating electronic resources for long term use
- retrospective sources should be selected carefully based on their intellectual content; that digital surrogates should effectively capture that intellectual content; and that access should be offered in a more timely, usable, or cost-effective manner than is possible with the original source documents.
- long-term utility should be defined by the informational value and functionality of digital images, not limited by technical decisions made at the point of conversion or anywhere else.

The "full informational capture" approach to a digital conversion is designed to ensure high quality and functionality while minimising costs advocated not to scan at the highest resolution and bit depth possible, but to match the conversion process to the informational content of the origianl – no more, no less. It has been found that 600-dpi bi-tonal scanning would fully capture all text-based material[32]. Having decided what to capture, then we must also decide at what level and how completely to do it. Since the index contains meaningful words and phrases which could be useful for subject retrieval, it would be converted to text and the contents page may be captured as an image only[33].

Several questions and propositions arise during the digitisation process as:

How and why contents are created or acquired, agreements to co-operate, share or exchange data between different instituions; conditions and procedures required to meet legal and economic requirements; how/where it is stored; and what software and hardware is needed to access it[34]. In most important respects, a digital library is not different from a conventional library automation system and all remarks that can be made about the system architecture of library automation systems in general apply[35] to digitisation systems. Since the different steps in digitisation listed below must be identified and a workflow would be carefully designed and executed by each library, it is only possible to highlight the major changes under each of the steps

here.

4.1. Content Idenfication and Selection

Since contents of wide variety are available at the disposal of digitisation effort, the first step is to identify and select what to digitise and what not to. Policies and programmes of the library and on top of that the users' expressed and expected needs should influence this decision. The motivations would be on various counts such as costly and rare materials to prevent their mutilation and damage, fequently demanded materials to increase their access, difficult to retrieve materials to improve their search and dissemination, under-used materials to extend their use, etc.

4.2 Content Storage

Decision about procuring suitable hardware, software, networking, etc. should be made at this stage. This is not a problem at a time when systems with good processor speed and high memory capacity are available at affordable rates. Operational decisions as to whether collections or parts are to be stored centrally or distributed or the technical decisions as to what magnetic media and hardware are needed or whether refreshing or replacement of storage media is required, etc are to be taken if the digitised collection comprises of multimedia components like video or audiocassettes, then multimedia components and software are also to be procured.

4.3. Content Capture

Conversion of non-digital information into digital form is attempted here through different methods of scanning and keying in data. Due to the computer intensive work atmosphere prevailing in our institutions, the content would be available in the electronic form even when a printed product is generated, and library digitisation programmes can straightway collect these and proceed to further steps. If information is present only in print/ manuseript form, a pragmatic approach is to scan full-text and key in index and abstract for efficient selective retrieval.

4.4. Formatting, Encoding and Compression

How data is formatted (written to magnetic media), compressed and encoded (how internal semantic or syntactic are represented) will determine its portability across hardware and software

platforms and how it may be stored, manipulated, and subsequently enriched[36]. Crucial decisions on these counts are not only required for proper implementation but for efficient use too. To store digitised files, there are many formats to choose from[37] such as MS Word, LaTeX, Troff, GIF (Graphic Interchange Format) RTF (Rich Text Format), or MIF (Maker Interchange Format), and SGML in compliance with their DTDs (Document Type Definitions)[38]. Archive images are saved as TIFF (Tag Image File Format) which is the standard for high quality uncompressed raster images captured by scanners whereas full-sised and thumbnail Web Images are saved as JPEG (Joint Photographic Expert Group), the dominant standard in imaging applications[39]. TIFF is the most prevalent for conversion of paper back files, HTML/SGML (Standard Generalised Mark-up Language) is used by many large publishers after conversion from proprietary formats, and Portable Document Format (PDF) is the most prevelant format for purely electronic documents[40]. PDF documents retain all formatting and graphics, permit easy indexing and search by keywords and also allow links to other sites on the Web or annotations within the article[41]. PDF offers a number of benefits such as reading on different platforms; editing can be made at any stage; files much smaller than Postscript files; using less space and transmitting more quickly; offering a one-file solution for both print and online and facility to view using a free reader[42]. The text must be processed so that only the content will be indexed and the display can be as in the original or in a standard consistent for the whole collection[43]. In the Antique Books conversion, the original page image may be of over twenty megabytes, but the processed image, both print and background is around 50 kilobytes (400 to 1 compression is achieved by this technique)[44]. Compression technique may be used not only for saving space at the server side but also to effect fast transfer and retrieval over limited bandwidth.

4.5. Content Indexing and Metadata

Decisions are to be taken regarding what to be indexed (author, subject, keywords, phrases etc.), usage of stop words, vocabulary control, proximity searches, language and period limiting etc. Indexing strategy comprises not only what types of fields are to be indexed, but how they are to be treated (exhaustive of sparse). Implementation of indexes on the database management systems

is also of concern. Using the Dublin Core framework as the basis, the CDP identified eight optional elements and seven mandatory elements of creator, title, subject, description, identifier, date and format[45]. Many project managers acknowledged that the best practice would be to create the metadata at the object-creation stage, or to create the metadata in stages, with the metadata provided at creation augmented by additional elements during the cataloguing stage[46].

The information about a data resource's structure, contents, context, provenance, and history influences how a resource is located, managed and used, and frequently it reflects data acquisition decisions and the documentation standards and practices[47]. A database system to keep stock of digitised collection is important, as the task is to provide selective access to the data. Necessary front end to accept search queries and flash matched results would also be developed. Technical processing as is done for other documents will be attempted for digital elements here. On digitising an item marked in the OPAC, we can also link digital images of contents with associated information in the database.

4.6. Rights Management

Intellectual property rights and related legal issues including data protection and confidentiality, or the legal obligation to select and preserve categories of records have become so vexed and crucial to implement in the digital context. Also the misuse that can be put to digised content is far more serious and voluminous than for printed. "How and whether it may be represented in machine-readable form; how, by whom, and under what conditions it may be used; how it can and should be documented and even stored, and how, whether, and by whom it can legally be preserved"[48]. How the system will be foolproof for access from unauthorised quarters as security restrictions on the systems is also important. It can be implemented by ID validations of client, further restricted by login and password. Precautions from operational perils like virus, server access problems, hacking etc. are also to be taken. Version control is also important for digital information, as editions are not correctly marked as in the case of print documents.

4.7. Other Issues

Since computers and allied technology are embedded in proprietary developments from many firms, it is always important to stress for interoperability and the need for standards and standardisation. Library profession is much concerned and involved in adopting standard procedures that enrich the value of the profession. How to develop protocols for use by other institutions and arriving at mechanisms for ongoing evaluation are also important.

5. CONSTRAINTS TO DIGITISE

Four issues identified as threats to digital preservation are technology obsolescence, insufficient resources, insufficient planning and physical condition of materials[49]. The constraints in initiating digitisation programs in the national context are to be looked at from the following perspectives.

5.1. Technology

There exist as many ills as virtues for technology and computer technology is no different either. How good and effective is technology is also a matter of debate. Not to say that technology is bad, but very new things (especially software) have a habit of not working properly for quite a while[50]. Even if the media are preserved intact, digital materials become unreadable if the playback devices necessary to retrieve information from the media become obsolete or if the software that translates digital information to human-readable from is no longer available[51]. The database technology is so rapidly changing that each collection must be migrated onto new data management systems, simultaneously with the migration of the individual data objects. The ultimate goal is to preserve not only the bits associated with the original data, but also the context that permits the data to be intrepreted[52].

There are threats to digital medium as for print medium and there are also concerns about ease of modification, lifetime, technology upgradation and obsolescence. The electronic products are vulnerable to the same enemies that threatened paper, *viz.*, natural threats such as light, moisture, and heat; organic threats such as rodents and insects; and chemical threats such as acid content, air pollution, and plastic. Also they face new problems like obsolescence[53]. Digital materials are especially susceptible to

loss and destruction because they are stored on fragile magnatic and optical media that deteriorate rapidly and that can fail suddenly from exposure to heat, humidity, airborne cantaminants, orfaulty reading and writing devices[54]. Although we can still read manuscripts that are a thousand years old, we cannot read some materials less than 20 years old[55]. (Read the word 'some' as 'electronic' or 'digitised'). Migration to new storage system is expensive, and there is always concern about the loss of data or problems with the quality when a transfer is made[56]. Data degradation is a concern and the ease with which a document can be changed, either deliberately or by accident, is an issue as well[57].

Technologis not always perfect and it is changing quickly. For Example, OCR conversion is not an exact science and considers an accuracy rate of 99.7% which means that three characters in 1000 are wrong leaving every 67th word with a spelling mistake on average which when indexed leads to confusion and can be monumental task to correct[58]. While some fear that all the work being done to digitise information will be lost with the next major change in technology, software publishers in recent years have been careful to assure that newer versions of software usually accommodate files produced by older versions[59].

5.2. Infrastructure

The significant human labour required for editing, inspecting, correcting and "tagging" (with appropriate metadata) digital objects might inhibit libraries from initiating largescale digitisation efforts[60]. Access to hardware and software, access to telephone connections, and knowledge of protocols can limit access to important information if its available only online[61]. The actual costs of retrospective conversion will vary according to the condition, formats, content and volume of the original collections; the choice of scanning technologies; scanning in-house versus contracting; the level of metadata needed to provide basic access; and the range of searching / processing functions to be supported[62]. Funds are always on the decline or being kept steady or enhanced only to counter the price increase and / or inflation. Since a large part of the library budget will be spent on staff and collection (often in print), there is very little left for buying computer systems and allied equipment like scanners, etc., and software required for digitisation.

5.3. Sources

There are resources not possible to digitise either as the copyrights are held by some one else or their physical sise or condition is prohibiting transfer to electronic form. A wide array of contents held by our library could only be used in the print form as per the existing rules.

5.4. Copyright

Scholars had sometimes included graphics and other copyright material in their theses and dissertation without acquiring permissions unless the work was accepted for commercial publication[63]. There will be demands from the user community to digitise formal collection of books and back volumes of journals for which the library has no copyright authentication to do. The users thus get discouraged by the digitisation work and show less enthusiasm towards use of those converted resources. Even for those sources digitised after procuring the legal rights, there might be problems to enforce them as the network and digital information is so pervading.

5.5. Difficult to Archive

In contrast to the source-related concerns only for print archiving, technology related concerns in addition are to be addressed for digital archiving. Access to technology is still limited, limiting the availability of digital information and some may want to include interactive components, CGI-scripting elements that are becoming common on Websites and elements that are not easily archived because they may change with each "reading"[64].

5.6. Paper Centric Attitude

We are so addicted to the print environment that we see digital information only as a supplement and not as a substitute. There are various typographic conventions employed to assist the reader such as titles, headings, subheadings, typefaces, punctuation and the like along with column width, proportion, density, paragraphing, page breaks and folios unique to printed sources which are generally neglected, impossible to reproduce or inherently invisible in sequential screen viewing[65]. Also digital information is fragile than paper or microfilm and can be more easily corrupted or altered without recognition; the storage media have shorter life spans; and digital information requires access

technologies that are changing at an ever-increasing pace[66]. Since reading lengthy works online is still a formidable task unless you have very good eyes, no one is going to sit and read a whole book online, and its costs money and time to download it and print it[67].

5.7. The Mindset

There are human resource implications, including the need for more staff to carry out labour-intensive digital work, the demand for staff with new and different skills, the challenges of "upskilling" and retraining, and the need to redefine job descriptions and skill requirements[68]. Even though contents are aplenty in our libraries for digitilisation, still there are lack of concrete projects for library digitisation. This can be attributed only to the mindset. Here comes not only the lack of interest of the professionals, or the loading of professional time for routine tasks leaving them very little time to innovate, but also the matter of wide concern about the lack of priorities from the Institution side for framing, supporting and implementing viable projects.

6. CONCLUSION

We have seen that digital library development and digitisation of local collection is a logical culmination of the exposition, library community spent on computer technology over the last few decades. Though our libraries are facing a shortage of contents like books or journals, there is a wide spectrum of formal and informal sources available with them that could be converted into digital form by devising suitable action plan. Image formats, compression schemes, network transmission, monitor and printer design, computing capacity, and image processing capabilities, particularly for the automatic extraction of metadata (*e.g.* OCR) and visual searching (*e.g.* QBIC), are likely to improve dramatically over the next decade[69]. But technology alone will not determine the future; relationships, economies and patterns of behaviour are equally important[70]. It is not technology that is hampering our libraries to venture into digitisation but the various factors of infrastructure, manpower, finance, and lack of priorities. These problems have no quick remedies and would be overcome only through programmes and follow up action to address them. Some of the underlying issues with their solutions are highlighted. Perhaps this is high time to propose an Indian Digital Library of

Theses and Dissertations, with similar initiative for Indian journals as well as out-of-print books. There is equal concern for a country so diverse and spread like ours to identify national, regional, and local institutions to share the responsibility of digitising and preserving the country's intellectual output. The emerging information age also calls for proper documentation and conservation of local arts and culture, traditional systems of medicine and engineering, indigenous vocational systems etc. Through pragmatic application of digital technology, we may be able to spread the conserved knowledge to a larger audience not only to improve the living standards of our community but also to claim our rightful place in the global village.

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61

Digital Libraries : Apprehensions, Aspirations and Challenges

RASHMI YADAV *
R L ARORA **

ABSTRACT

The paper discusses the concept of Digital Library, its nature, functions and assumptions. It discusses the apprehensions like phobia to computer, regressive attitude, cognitive factors etc. and the challenges before the professionals of coming generation. Measures to overcome those apprehensions have been suggested.

1. INTRODUCTION

The information technology (IT) revolution is rapidly widening its horizon of applications promising a quick accessibility of information by the users on one hand, and enhancing the productivity of information workers on the other. It is becoming increasingly clear that the emergence of digital libraries will severely improve the traditional functions of libraries, readers, library professionals, authors, editors, publishers, booksellers etc. How soon these changes would occur, is hard to predict in Indian context, but the technological foundations for digital library structure are in the offing and the pressures of social and organisational changes will follow.

The development of digital libraries is a logical extension of

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the developments in information technology. The advent of the digital libraries is important to take advantage of the information resources. A number of high-end tools and technologies are being developed worldover through several digital library initiatives. Using the Internet and its resources for providing information services requires a re-orientation of traditional skills of librarianship. With the available infrastructure in the country we can make a beginning in exploiting the digital resources on the Internet for the provision of better and newer services.

2. DIGITAL LIBRARY—A DEFINITION

The digital libraries may be defined as the new way of carrying out the functions of libraries encompassing new types of information resources, new approaches to acquisition; new methods of storage and preservations; new approaches to classification and cataloguing; intensive use of electronic systems and networks; and dramatic shifts in intellectual, organisational and electronic practices. It is also known as a distributed text-based computerised information systems and service. It may have several provisions to access documents/information which are of high value and are mostly available outside the organisation as defined by the Working Group of the U.S. government's Information Infrastructure Technology and Applications. "Digital libraries are systems providing with coherent access to a very large, organised repository of information and knowledge". "Digital library is a global virtual library – 'The Library of thousands of networked electronic libraries' according to Ray R. Larson. A. N. Yerkey defined digital libraries as "electronic libraries in which large number of geographically distributed users can access the contents of large and diverse repositories of electronic objects".

Thus, digital libraries will be network based distributed systems with individual servers responsible for maintaining local collections of digital documents with the provision of sets of electronics text to video-on-demand services. From the user's point of view, however, these appear to be a single digital library system, integrating personal information, work group and organisational information collections and other information resources.

There is also a general acceptance of the fact that digital

libraries are required to span both print and digital materials. For the foreseeable future, print on paper publications are expected to be around and, thus, digital libraries are expected to provide integrated coherent access to both types of materials.

Key components of digital libraries are :

(*i*) Geographically distributed digital information collections.

(*ii*) Geographically distributed users.

(*iii*) Information represented by a variety of digital objects.

(*iv*) Large and diverse collections.

(*v*) Seamless access.

Any digital library system should, therefore, provide a coherent, consistent view of as many repositories as possible and

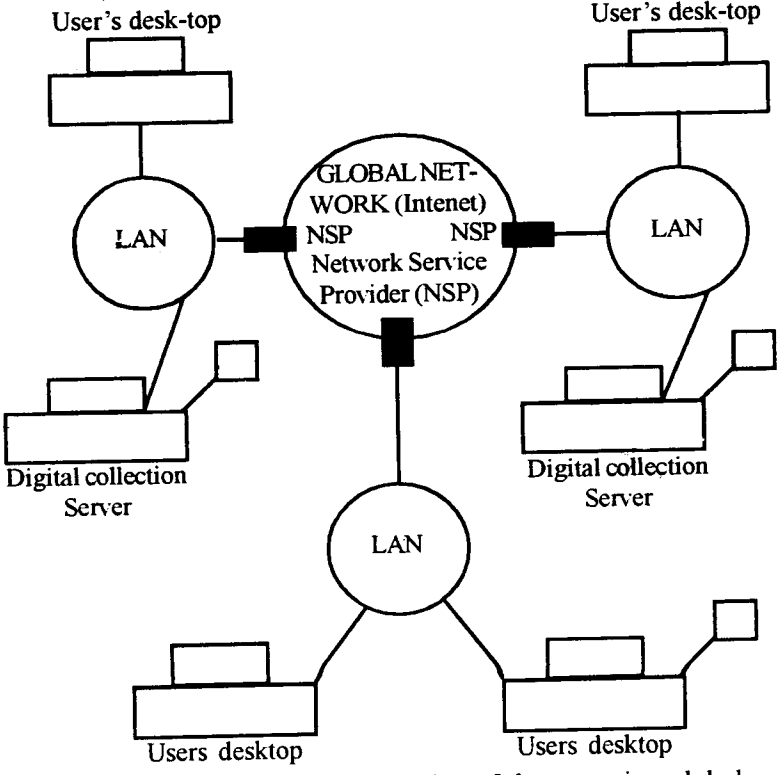


Fig. 1 : Schematic representation of the emerging global Digital library environment.

allow users to seamlessly connect and interact with information with regard to geographical location or time. The schematic representation of the emerging global digital library environment is shown in Fig. 1.

The personal computer in the library may be connected to the global network *via* institutional area networks and Internet service providers. Using powerful, but very user-friendly browser programmes on their PCs-users will be able to seamlessly connect to and extract information from digital libraries, distributed over a geographical area.

3. ASSUMPTIONS FOR DIGITAL LIBRARIES

In the context of digital library, four assumptions can be identified as:

(*i*) Digital library is totally a paperless system with computer networks and communication facilities.

(*ii*) Digital library is a supplementary facility to traditional library for better retrieval and faster communication.

(*iii*) Any individual can have a direct link to electronic publishers, their agents / through computer communication facilities, with or without knowledge of librarianship.

(*iv*) Any commercially interested organisation or an individual, with or without knowledge of librarianship, having a direct access to electronic publisher can become local promotional trade agent in information service, like one of the ISD / STD centres, electronic typing centres, reprography centres etc.

According to Hulser[2], the key functions of the digital library are:

(*i*) to manage large amount of digital content of information.

(*ii*) to preserve unique collections through digitisation.

(*iii*) to perform searches that are not practical manually.

(*iv*) to protect the content of information.

(*v*) to deal with data from multiple locations.

(*vi*) to enhance the distributed learning environment.

4. APPREHENSIONS AND EXPECTATIONS

The adoption and acceptance of new technology of digital libraries will never be straightforward and monolithic, inspite of its expected dominance.

4.1 Apprehensions

The apprehension in the mind of the people, is normally due to psychological aberrations and ambient environment.

4.1.1 Techno phobia

Some people have a fear of accepting any upcoming technology. Individuals may have several reasons for not using the new technology. The underlying reluctance amongst the common users of electronic media, is generally the apprehension of getting the system scrapped. In India, many professionals are still satisfied with traditional library routine services.

4.1.2 Lack of knowledge

During the last decade, there has been parallel growth in technology, awareness and services. Lack of knowledge about these developments pinpoint the characteristics of individual librarians and their enthusiasm for learning.

4.1.3 Stress

Some experts are of the opinion that there may be physical stress due to flare and glare of electronic operations. To work overload and glutting of heterogeneous jobs invite stress to the minds of information handling personnel.

4.1.4 Apprehension of failure

The official bureaucracies, fiscal inputs, and maintenance implications are the major factors causing fear of failure. Sometimes audit consequences in the organisational processes are also provoking the services with fearful blinkering to be minimum, optimum, or maximum.

4.1.5 Fear of Damage

The earlier generation librarians are sometimes worried about the expense, safety and the damage to digital equipments.

4.1.6 Resistance to change

The rigid sense among some of the professionals / library

workforce to change to the nascency and decency of the information system, always remains due to known reasons. The natural resistance of potential users to respond to the changes of using electronic services, as visualised by Newcomb are:

(*i*) psychological unpreparedness to change their reading habits which is forced to go on screens.

(*ii*) cost of electronic products as compared to print products.

(*iii*) preference to select needed information faster by reading the printed products than its retrieval by watching the scrolled screens.

(*iv*) affordability of electronic products in totality.

4.1.7 Reverse attitude

The conceptualisation and social impact of digital libraries are two basic reasons for its proactive or reverse effects. The librarians and end users would definitely frown if the concept or background knowledge base to digital devices were not ingranied into them well in advance.

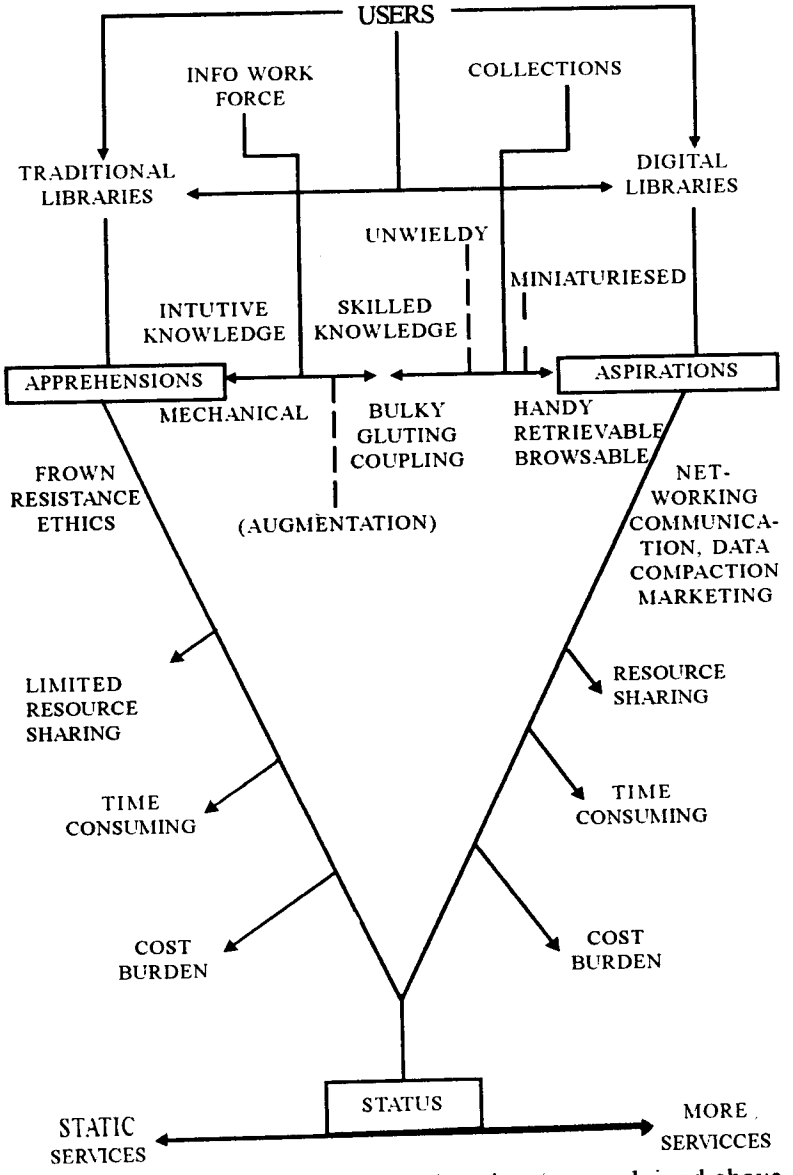
4.1.8 Apprehension of downsizing

With the advent of computer profiling data updating trends, the glare of *status quo* has occupied the corporatised organisational activities. The decisionmakers or policydesigners are either in tyranny of time resulting in over-occupation or apprehension downsising of the status.

4.1.9 Ethical problems

The problems of ethical kind in digital library operations, hereinafter concerned to end-users are prevalent almost in every working environment. The off-line searches, printing and organisation of digital librarians are ethically scrolled up and thus the acceptance of its predominant features gets delayed.

4.2 Aspirations



Apart from the intricacies of apprehensions, as explained above, the scope of aspirations is increasingly becoming wider. A schematic representation is shown in Fig. 2.

Fig. 2 : Schematic Representation of Apprehensions and Aspiration

In digital library environment, some novelties like text, images, DTP, hypertext, CD-ROM databases inter-networking, highway communication have come up. Generally, speaking, the technical and communication environment is expected to be very rich for creating, processing, storing, reorganising, replicating the digitised text, graphics, statistics etc. Driven to the valued features of digital libraries, many merits as detailed below are visualised:

(*i*) Quick retrieval of information and time saving.

(*ii*) Reliability and quality of data.

(*iii*) Shrinking of bulk space.

(*iv*) High-speed communication and Internet working.

(*v*) Greater output.

(*vi*) Increasing scope for information marketing.

(*vii*) Economy for the industry / organisation.

(*viii*) Scope for knowledge augmentation.

(*ix*) Decision support mechanism.

(*x*) Thrusting global competitiveness.

(*xi*) Increasing resource-sharing opportunities.

5. CHALLENGES AND ISSUES

The highest priority of a library, digital or any other, is to serve the research needs of its clientele. The development, maintenance and extension of its collection and its technologies must be supportive to this primary objective. However, in digital library environment.

- Functions of authors, publishers, vendors and users, etc., will vary. Both information professional and user will do collection, storage, dissemination and organisational work. The user's work is however called as personal file collection. Anyone who has access to computer in a network can easily become a publisher. An Author merely by posting messages to an online discussion group, becomes a publisher. In such environment information appears in one day and can be altered

or removed the next day. In this situation, many questions such as, how to give a citation ? How to collect a copy of the required information ? How to organise the information ? remain.

- When there are budget cuts in the organisation, information services and libraries are often among the earliest victims. The downsizing of digital devices under such circumstances is depressing and technology switchover may seem to be bleak. The organisational viewpoints need some inclusive resetting towards the digital libraries concept.
- Users only locate the information; which are not usually structured. There may not be any control on the information that is made available.
- Traditional library schools curriculums have tended to be too conservative both in the context of broadening the knowledge and application of information technology. Theoretically speaking, the modalities of curriculum specially in India, is in dilly dallying position except in few exceptional cases. The emphasis should now be to take a fresh look at the curricula in the digital technology environment.
- Specialised technologies are needed for compressing as well as for organisation of information. Database management methods extended, relational or object oriented, are needed not only to support direct use of data collection in digital library, but also to handle catalogues, and other services.
- Training and development opportunities for librarians and end users for optimal utilisation of digital innovations, are to be encouraged and revitalised.
- Importing of technology has been a great barrier until recently, but it is being gradually simplified because of the liberalisation programmmes of government.
- Security shocks are the most pressing challenges of digital affairs. Privacy of database, copyright infringement, virus invasions, parallel satellite networking stresses are some of the issues for digital libraries to be confronted as a way of routine.

6. CONCLUSION

Digital libraries use information technologies, communication

technologies, online databases, CD-ROMs etc. which require access to national and international networks. The issues which should be dealt with before the switching over to digital libraries are information protection, intellectualy property rights, privacy, relevance of information available in digital libraries as well as its value and data security. In order to have a good digital library system :

(*i*) We must study and understand the transformation, which are now taking place in the technology field.

(*ii*) Must develop mechanism for sharing of information at local, national, regional and international level.

(*iii*)Must implement comprehensive and cohesive information technologies.

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62

Issues and Challenges in Creating Digital Libraries

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ABSTRACT

The idea of easy and instant access to information in what we conceptualise as digital libraries today has continued to evolve with each advance in Information Technology (IT). Many people consider the Internet or World Wide Web as a digital library because of the presence of huge collection of documents where they can find the desired information. But the Internet and the Web are not designed to support the organized publication and retrieval of information, as libraries are. Digital libraries are libraries with the same purposes, functions and goals as traditional libraries constructed to serve particular communities. The paper begins with some of the main issues and challenges in creating digital libraries—like architecture, collection development, metadata as tool for cataloguing Web resources, services, and preservation management and ends with issues involved in the protection of copyright of digital resources.

1. INTRODUCTION

The desktop-accessible storehouse of information for which different phrases like 'electronic library', 'virtual library', 'library without walls' etc., has been used by the library community over the years is now identified with the most current and most widely accepted concept of "Digital library". Digital libraries are at the focal point of many areas of research, and what constitutes a digital library depends upon the research community that is describing it. For example, from an information retrieval point of view, it is a

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large database; for people who work on hypertext technology, it is an application of hypertext method; for those working in wide area information delivery, it is an application of the World Wide Web; and for Library Science, it is another step in the continuing automation of libraries that began over 25 years ago. In fact digital library is all of these things. A fairly spectacular example of what many people consider to be digital library today is the World Wide Web. The Web is a convergence of thousands and thousands of documents. Many would call this huge collection a digital library because they can find information, just as they can do in a digital collection. Actually the Internet or its collection of multimedia resources is not designed to support the organised publication and retrieval of information as libraries are. In short the Internet is not a digital library.

2. WHAT IS A DIGITAL LIBRARY?

We should assume that digital libraries are the libraries with the same purposes, functions, and goals as traditional libraries. The collection development and management, subject analysis, index creation, provision of access, reference work, and preservation are some of the main activities performed in a digital library as is done in a traditional library. Digital libraries are organisations that provide the resources, including the specialised staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities. With the assumption that digital libraries are libraries first and foremost, we can list some of the characteristics:

- Digital libraries are the digital face of traditional libraries that include both digital collections and traditional, fixed media collections. So they encompass both electronic and paper materials;
- Digital libraries will also include digital materials that exist outside the physical and administrative bounds of any one digital library;
- Digital libraries will include all the processes and services that are backbone and nervous system of libraries. However, such traditional processes, though forming the basis of digital

library work, will have to be revised and enhanced to accommodate the differences between new digital media and traditional fixed media;

- Digital libraries ideally provide a coherent view of all of the information contained within a library, no matter its form or format;
- Digital libraries will serve particular communities or constituencies, as traditional libraries do now, though those communities may be widely dispersed throughout the network;
- Digital libraries will require both the skills of librarians as well as those of computer scientists to be available.

However the digital library will not be a single, completely digital system that provides instant access to all information, for all sectors of society, from anywhere in the world. This is simply unrealistic. This concept comes from the early days when people were unaware of the complexities of building digital libraries. For librarians, the characteristics of digital libraries as described above, are the most logical because they expand and extend the role of traditional library, while integrating new technologies, new processes, and new media.

The advantages of having digital library system are:

- Providing instant access for any one and every one to a worldwide repository of information in its original format.
- Protecting rare books and historic documents that are rapidly detoriating through vandalism or overuse. In digital form they can be viewed repeatedly and copied without harming the original.
- Solving massive storage problems. Materials that take up many shelves can be stored on a single disc.

3. ISSUES AND CHALLENGES

Creating digital libraries poses serious challenges. Because of the unique nature of digital information, it is less fixed, easily copied, and remotely accessible by multiple users simultaneously. Some of the more serious issues facing the developments of digital libraries are outlined below.

3.1. Technical Architecture

The first issue is that libraries will need to enhance and upgrade current technical architectures to accommodate digital materials. The architecture will include components such as:

- High speed local networks and fast connections to the Internet;
- Relational databases that support a variety of digital formats;
- Full text search engines to index and provide access to resources;
- A variety of servers, such as Web servers and FTP servers;
- Electronic document management functions that will aid in the overall management of digital resources.

Within a coordinated digital library scheme some common standards will be needed to allow digital libraries to inter-operate and share resources.

3.2. Building Digital Resources

One of the largest issues in creating digital libraries will be the building of digital resources. Obviously, for any digital library to be viable, it must eventually have a digital collection. There are mainly three methods of building digital collection:

- Digitisation, *i.e.* converting paper and other media in existing collection into digital form
- Acquisition of original digital works created by publishers and scholars, *eg.*, electronic books, electronic journals, and databases.
- Access to external materials not held in-house by providing pointers to websites, other library collections or publishers' servers.

While the last mentioned method may not exactly constitute part of a local collection, it is still a method of increasing the materials available to local users. One of the main issues here is the degree to which libraries will digitise the existing materials and acquire original digital works, as opposed by simply pointing to them externally. Acquiring digital works and doing in-house digitisation are expensive, especially to undertake alone by a single institution. By working together, institutions with common goals can gain greater efficiency and reduce the overall costs involved in these activities. It also reduces the redundancy and waste of

acquiring or converting materials more than once. Moreover, coordinated digital collection building enhances resource sharing and increases the richness of collections to which users have access.

3.3. Digitisation

Digitisation refers to the conversion of an item—be it printed text of a book or journal article, manuscript, image or sound, film or video recording – from one format (usually print or analogue) into digital format. For example, an image of the physical object is captured – using a scanner or digital camera and converted to digital format that can be stored electronically and accessed *via* a computer. One great advantage of electronic textual materials is the ability to search the entire contents for any word. A second advantage of digital documents is ubiquity. A single electronic copy can be accessed simultaneously from many locations, by many users (assuming copyright permissions available). This feature, in conjunction with the development of the information superhighway and particularly the World Wide Web, means access over different kinds of machines and multiple platforms. There are several approaches available to decide which parts of a collection are to be digitised, namely:

- Retrospective conversion of a collection. But, it is to be admitted that the idea of complete conversion of existing materials is impractical or impossible technically, legally, and economically.
- Digitisation of a particular special collection or a portion of it. A small collection of manageable size, and which is highly valued, is a prime object for digitisation.
- Highlighting a diverse collection by digitising particularly good examples.
- Digitisation of high-use materials, *i.e.* it digitising those materials that are in highest demand.
- An ad-hoc approach, where materials are digitised and stored on request. This is however, a haphazard method of digital collection building.

These approaches can be implemented alone or in combination depending upon a particular institution's goals for digitisation. The basic process of digitisation is fairly simple though a wide

range of sophisticated techniques and tools may be used.

3.3.1. Scanning

Scanning is the most cost effective way to create a digital file. Creating digital image of the original source material is the only way for accurately reproducing its information content, layout and presentation. In the case of printed documents, this means that the typefaces of the original text can be retained in the electronic copy alongwith diagrams, photographs, and even handwritten annotations that have been added in the page margins. There are various types of scanners available.

3.3.2. Optical Character Recognition (OCR)

When a page is scanned, an image file is created and manipulation of the text is not possible as the image file contains only a digital representation of the "look" of a printed page but lacks understanding of any of its contents. This restricts the use of the scanned document and limits the advantages of digital documents until a way out is found to extract the contents of the digital image into text. Optical Charactor Recognition (OCR) is a process by which a page image is transformed into text file and it can recognise the letters, words, symbols printed on a page. OCR systems may also use spell checkers and error correction. Thus the process by which a page image of a printed or typed material is transformed into a text file is Optical Character Recognition.

3.3.3. Markup

Some standards are required to make it possible to send and receive digital information, across the various Local Area Networks (LANs) or Wide Area Networks (WANs). These standards are markup languages like Standard Generalised Markup Language (SGML), Hypertext Markup Language (HTML) and Extensible Markup Language (XML). With the help of these markup languages, texts, graphics, images, and sound etc. of the documents are designed and identified using different tags. By this, digital information can be accessed, retrieved and transmitted on the Web.

3.3.4. Metadata

Metadata is a matter central to the development of digital libraries. Metadata is the data that describes the content and attributes of any particular item in a digital library. It is a concept familiar to

librarians because it is one of the primary things that librarians do – they create cataloguing records that describe documents. Metadata is important in digital libraries because it is the key to resource discovery and use of any document. A number of schemes have emerged, the most prominent of which is the Dublin Core, an effort to try and determine the 'core' elements needed to describe materials. The Dublin Core metadata has defined a set of fifteen metadata elements much simpler than those used in traditional library cataloguing. They were designed to be simple enough to be used by authors, but at the same time, descriptive enough to be useful in resource discovery.

3.3.5. Naming, Identifiers, and Persistence

These are the issues related to metadata. Names are strings that uniquely identify digital objects and part of any document's metadata. Names are important in a digital library, as an ISBN number in a traditional library. They are needed to uniquely identify digital objects for purposes such as: citations, information retrieval, to make links among objects and for the purposes of managing copyright. Any system of naming that is developed must be permanent. The unique name and its location must be separate. This concept is different from URL, the current method for identifying objects on the Internet. A global scheme of unique identifiers is required; one that has persistence beyond the life of the originating organisation and that is not tied to specific locations or processes. These names must remain valid whenever documents are moved from one location to another, or are migrated from one storage medium to another. Three examples of schemes proposed to get around the problem of persistent naming are PURLs (Persistent URLs), URN (Uniform Resource Name), and DOI (Digital Object Identifier)

3.4. Preservation

Preservation in the case of Digitisation is keeping the digital information available perpetually. In the preservation of digital materials, the real issue is technical obsolescence. Libraries in the pre-digital era had to worry about climate control and the de-acidification of books. But the preservation of digital information will mean constantly coming up with new technical solutions. Digital preservation is a process by which data is preserved in digital form in order to ensure usability, durability and intellectual

integrity of the information contained therein. According to Kelly (1999), it is the storage, maintenance, and accessibility of digital object (includes any digital material such as a text document, an image file, a multimedia CD-ROM or a database) over long term, usually as a consequence of applying one or more digital preservation strategies.

Digital objects are accessible only through combinations of hardware and software. The hardware and software become obsolete in cycles of less than three years. Ensuring ongoing access therefore, requires currency with technology changes, and moving digital objects from obsolete to current file formats, storage media, operating system and so on. A digital preservation strategy is evaluated against a set of criteria such as technological feasibility, cost-effectiveness in retaining the essential attributes of digital information and acceptance by creators, managers of digital repositories, and user communities.

Migration is the primary strategy employed by most organisations that plan to preserve digital resources. It covers a range of activities to periodically copy, convert or transfer digital information from one-generation technology to subsequent ones. Emulation strategy has attracted attention as a potential strategy to assist preservation. It refers to creating new software that mimics the operations of older hardware or software in order to reproduce its performance. There is another process of preservation, which involves printing out digital material and preserving the paper copy. But many digital objects simply cannot be printed and would lose most of their unique functionality and attributes by printing.

3.5. Copyright / Intellectual Property Rights

Copyright has been called the "single most vexing barrier to digital library development". The current paper-based concept of copyright breaks down in the digital environment because the control on copies is lost. Digital objects are accessed by multiple users and can be easily copied. The problem for libraries is that, unlike private businesses or publishers that own their information, libraries are for the most part, simply caretakers of information – they do not own copyright of material that they hold. It is unlikely that libraries will ever be able to freely digitise and provide access to the copyrighted materials in their collections. Instead, they will

have to develop mechanisms for managing copyright, *i.e.* mechanisms that allow them to provide information without violating copyright.

If a library has copyright of its digital information other unauthorised party or person may duplicate the digital information, hence, the need for effective copyright protection tools. Copyright owners want to be compensated every time their work is used. Further, they want to be sure that their works are not used in an improper way *e.g.*, modified or edited without permission. Various attempts are being made by software companies to develop their own software so that the information—it may be textual, audio, visual, images etc.—can be protected in their respective files. Cryptography can be used in a number of ways to keep information private and to provide a framework for secure message exchange and transmission. Digital signature, digital certificates, digital watermarking etc. are used to protect digital resources.

4. CONCLUSION

Libraries around the world have been working for several years on different aspects of digital library and sets of challenges relating to it. They have created many digital library initiatives and projects, and have formed various national schemes for jointly exploring key issues. As with most technical developments in libraries over the years, we will have to move forward in small, manageable, evolutionary steps, rather than in a rapid revolutionary manner for creating digital libraries. For this we should keep in mind the different issues and challenges involved in creating digital libraries.

Selected Websites

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3. http://www.dlib.org/dlib/december96/rlg/12erway.html
4. http://aultnis.rutgers.edu/texts/DRC.html
5. http://aultnis.ritgers.edu/texts/dps.html
6. http://www.sciam.com/0397/issue/0397lesk.html
7. http://www.sciam.com/0397issue/0397lynch.html
8. http://www-diglib.stanford.edu/diglib/pub/reports/iita-dlw/

main.html

9. http://www.dlib.org/dlib/november96/11miller.html
10. http://www.computer.org/pubs/computer.org/pubs/computer/dli/
11. http://www.rlg org/ArchTF/tfadi.index.htm
12. http://www.clir.org/pubs/issues/issues04.html
13. http://www.dlib.org/dlib/July95/07weibel.html
14. http://www.nla.gov.au/padi/topics/13.html

63

Towards the Digital Library: Impact on Librarians

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ABSTRACT

The article discusses the transition of libraries from the traditional to digital ones and especially in the Indian context. It also discusses the impact of digital libraries on the librarians and concludes that the librarians will continue to play an important role in the digital era in case they navigate themselves as information managers and information analysts.

1. INTRODUCTION

Advances in computing and communication technologies, enormous growth of the Internet and World Wide Web, easy and economic access to global information through the Internet and developmen in electronic media have led to the growing interest in the development and use of digital libraries. The work on various digital library projects throughout the world[1] points out that the transition of the traditional library to digital library will be faster in the near future and the concept of virtual library *i.e.* a library without walls will not be merely a utopia but a reality.

2. DIGITAL LIBRARIES

Digital libraries have become a topic of much debate and discussion these days. Some use it to refer primarily to collections

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of digital information; others use it to refer primarily to the information technologies managing them. The most appropriate meaning encompasses both of these: digital libraries are large scale, organised collections of multimedia data with information management tools and methods capable of presenting data as useful information and knowledge to people in a variety of social and organisational contexts[2]. It implies that digital libraries both reveal and require new models for information access and use by increasingly diverse, numerous and populous user community[3]. In order to access digital information, it is necessary to use either special purpose multimedia reader stations or some form of computer system. This equipment may be located within the confines of a community public reading room or within individual rooms used for private study. The information can also be accessed remotly via telephone modems or by means of communication networks. The main features of digital libraries are:

- Digital libraries are a set of digital resources and associated technical capabilities for creating, searching and using information.
- Digital libraries consist of digital data in a variety of media forms such as text, images—static or dynamic, graphics, audio, video etc.
- Digital libraries can be accessed from users' workplace.

3. TRANSITION OF LIBRARIES TOWARDS DIGITAL LIBRARIES

As a consequence of the incorporation of new technologies in the libraries, the transition of the libraries from the traditional to automated, to electronic and to digital ones is well reflected in a number of ongoing research and development projects that have recently been described in the literature[4-9]. Libraries throughout the world are fast emerging to digitise their resources and making these available electronically over the World Wide Web and providing online services to those who wish to get information and knowledge from terminals at their office or home. If Indian libraries are to stay in the game and provide enhanced, timely, reliable qualitative and value-added services to the users, then a clear and effective digital library model for library services and development will be increasingly important.

4. DIGITAL LIBRARIES: INDIAN SCENARIO

The scenario on the Indian library horizon too is changing but at a very slow pace. Indian libraries though somewhat slow to react to the developments of IT, too are experiencing a transitional phase. Computers are now being extensively used in many of the libraries for automating a number of library operations. They have started making use of E-mail, Internet and acquire CD-ROM and multimedia publications. Several software packages for library automation and current awareness and SDI services such as DELSIS, SUCHIKA, SANJAY, GRANTHALAYA, LIBSYS, WILISYS, SALIM, LIBRARY MANAGER, GOLDEN LIBRA, NILIS, SOUL have been developed and are in use.

The emergence of various digital networks at the national and local levels such as INFLIBNET, DELNET, CALIBNET, BONET, MALIBNET, NICNET, INDONET, ERNET point out that the development of digital libraries in India will be faster in the near future.

INFLIBNET is playing a commendable role in the direction of metamorphosing academic and special libraries into digital libraries. Creation of union databases and making these available online, conversion of library records into machine readable form, software development, networking facilities to the participating libraries are some of the steps on the part of INFLIBNET which will go a long way in fulfilling the mission of digital libraries combining all libraries/information centres irrespective of their physical location[10].

Some of the other healthy trends in this direction are development of indigenous databases and CD-ROM products. The popular Business India magazine is available in CD-ROM since December 1995. The other magazines: PC, Computers Today, Chip, Business World have started issuing CD versions. A few publishing companies are now releasing the sources in multimedia which are available at a very low cost. This is encouraging for the libraries to go for the development of the local databases, networking and multimedia databases.

The report of the National Task Force on Information Technology and Software Development (1998)[11] which recommended 'IT for all by 2008' is intended to give a boost to the use of IT in libraries.

5. IMPACT ON LIBRARIANS

The emergence of digital libraries raises the question of whether, and to what extent, will the traditional intermediary functions disappear, be replicated or transformed. Some librarians feel that their value as professionals will be diminished as digital libraries supplant those filled with physical books and periodicals. Many librarians fear that the public will bypass them and go directly to the source of information via the Internet. But their fears are mere misconceptions as "computers only manipulate numbers. It is the people that connect them to meaning. Librarians provide context to users. Even as the stuff of library collections begins to change and become collocated in the private digital libraries of publishers and content owners, the value of librarians who can effectively turn mere data into knowledge will be paramount[12]". Davenport and Prusak rightly remark that "no technologies currently available can decide what information should go onto the organisation's information network, how different information bases should be structured, and what information is worth keeping around..... Librarians are the most likely candidates for these roles, if they take up the challenge[13]". Moreover, the organisations that employ graduates of business schools with information systems background for information management remain "in danger of focussing on technology rather than knowledge[14]". Rowbotham[15], Klobas[16], Cronin[17] all feel that librarians will continue to play an important role in the digital era as they have particular knowledge and expertise in knowledge transfer. The only need is the willingness on the part of the librarians to adapt skills relevantto the digital environment. They can do well by helping the end-users perform efficient searches, consolidate information and provide value-added services to users. For this, they will have to develop skills of information analysis and synthesis.

Apart from playing the role of information brokers, the librarians can also start content development activities. Content creation and development is recognised as an important activity in the digital environment. Though technically a new concept, it is being practised by the librarians since long. The library cataloguing, indexing, abstracting and other related guides to information sources are the best examples in the context. However the growing emphasis of this aspect in the digital environment

requires some new approaches to content design and development. The librarians are expected to possess refined skills in data organisation and structuring and the presentation of the content in a helpful format so as to enable easy retrieval information by the users.

The content creation and development is surely a field with 'reckonable prospects' for library professionals. IT Task Force Working Group on Information Content Development (ICD) (1998) recommended the promotion of ICD industry. The ICD industry as well as the content development activity in libraries and information centres would require large human resources. As librarians have 'traditionally handled structuring, categorization, indexing and classification of information in the print environment,'[18] they seem to be best suited for the content development activities. Hence, they must benefit from this opportunity and prove their worth in this area of global importance. This, in turn, requires that Library and Information Science departments must re-orient their syllabii mill a view to develop proper skills in the students for content development and organisation of knowledge in the digital environment.

According to Peters[19] there are several areas in which today's information professionals can develop new skills. They must form strategies in order to change, survive and continue to compete in the world of electronic information. Some of these are:

- **Information anxiety amongst corporate knowledge workers**. The anxiety among knowledge workers is that they do not know the decision-making resources that can help them to learn. Information professionals can help them to find suitable sources of information.
- **Intellectual capital and knowledge management**. Intellectual capital is now-a-days increasingly being referred to as the new corporate asset. Using information resources to create a knowledge base to support the development of intellectual capital presents an important new strategic marketing opportunity for information professionals. They should seize the opportunity to help knowledge workers maximise the return on investment with decision-making information.

  The library and information professionals' potential role in

the digital and the end-user-oriented era, however, will depend on their capacity for re-engineering the library activities. The re-engineering process[20] includes:

- change in the role of the library professional from the traditional intermediary approach to one of integrating new information technologies for providing effective information services;
- assisting the people in the organisation to gathering information independently; and
- performing the creative task of information product development and product synthesis—thus providing information solutions and not just information.

But to be re-engineered and thus survive, the librarians should further improve their skills via good quality continuous education programmes, short term courses or post-graduate work. The LIS educational programmes too should be geared to the realities of digital age and aimed at producing graduates with a mix of technical skills and competencies.

6. CONCLUSION

To conclude, we can say that future is quite bright for the librarians/information professionals if they are able to promote themselves as information managers and information analysts. Strategic Agenda for the Ottawa Public Library (June, 1996)[21] presents a very optimistic picture of the future librarians:

"Library workers of the future will be the navigators, the facilitators and the mediators of the digital revolution. They will help people retrieve, organise or develop the information that they need....[But] they will need to train and retrain constantly....[to] have skills and strategies to meet the needs of people from different cultures, age groups, social and economic backgrounds, and levels of ability."

The Indian scenario too is quiet encouraging. Indigenous computing, information and communication technologies are developing at a rapid pace. and It is very much hoped that librarians will act fast to reap the gains of the new technologies for themselves and distribute the same to others.

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64

Collision and Adhibition of Electronics Publishing in Digital Libraries

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ABSTRACT

The digital libraries pose new challenges in the age of advanced Computer and Telecommunication Technology era which has an indispensable impact on networking systems to solve the emerging problems of the user communities who require information in a multifaceted form. The collection development of digital libraries through Internet coupled with its effective organisation, management and dissemination minimises the problems of the challenging need of the user community. The libraries and the information centres have accepted the new and advanced technological devices to satisfy the manifold need of user community. The role and advantage of digital ligraries in the present day context have been discussed.

1. INTRODUCTION

Information Technology (IT), a convergence of different technologies basically encrust all facets of managing and processing information. The primary keys developed designed to and support the same are the computer hardware, software, internet, intranet etc. IT with the help of computer technology, communication technology, multimedia technology, and Networks infact plays a pivotal role as a key and indispensable component for accelerating the process of development in the service fields like banks, railways, including libraries and information centres. The growing and unwavering thirst of the users for , multidimensional. pinpointed and authentic information at a least

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possible time with cost effectiveness and without any geographical proximity coerced the information managers, librarians, documentation officers to adopt the developing and advanced technologies. The libraries and the information centres in the helm of IT age no longer reckons the traditional shape of satisfying the varied requirements of the users rather, they adopted the technological devices to satisfy the information need of the users. The IT in the modern age has made it possible to change the shape of the library especially with emergence of digital Libraries. The collection development of Digital Libraries through Internet coupled with its proper and systematic organisation, management and effective dissemination, minimised the problems of the challenging need of the user community. The recorded form of information in the digitised bits could be able to reach the user's personal computers through the track of IT.

2. CONCEPT OF DIGITAL LIBRARY

The prolonged research and development in the field of Computer Technology has resulted to shape the term Digital Library which is more concerned to the electronic collections, its management, including its selection, acquisition, resource sharing, document delivery, electronic publishing etc. The collections of information in electronic shape and its record through on-line and off -line through various digitised collections such as CD -ROM, Floppy, Disk etc. establish the concept of Electronic Library. The library which provides the collections and/or services in electronic form through Video Disks, CD-ROM, etc. can be termed as electronic Library whereas, the library which provides electronic collections and or services electronically can be understood as digital library and the library without any physical existence in a boundary of building primarily concerned with website, is known as Virtual library. In the 21st century, these libraries which are basically non entity by its establishment has proved to be a positive means of managing knowledge, information in a digital format and support teaching, research and life -long learning. According to William Saffady, the digital Library concept may encompass the following areas:

(*i*) Machine readable data files, often withScientific and technical applications;

(*ii*) Components of the emerging national information

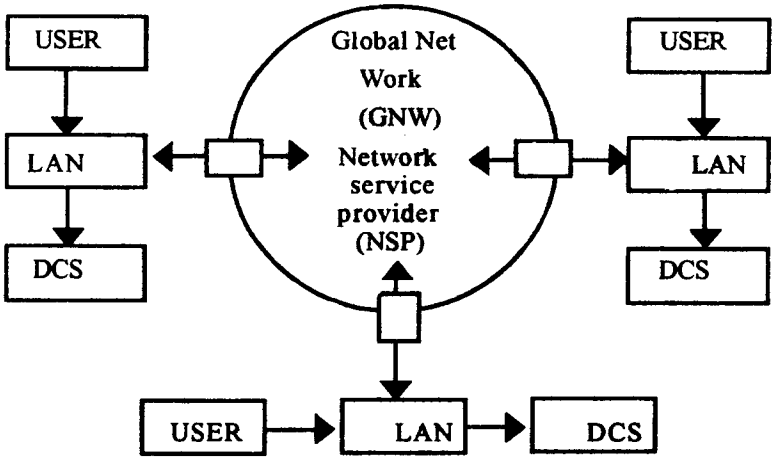
infrastructure;

(*iii*) Various On -line databases and CD-ROM information products;

(*iv*) Computer storage devices on which information residue, such as optical disk, jukeboxes or magnetic tap autoloaders; and

2.1. Computerised networked library systems

The digital libraries available in various forms are confined not only to the size of files, the format of content in a structured form of software on CDs, video clips, but also elongates its dominion to swift communication, Boolean search, browsing of information through websites on internet etc. A.N. Yerkey (1996) has thus. rightly remarked that, the Digital Libraries are basically the Electronic Libraries where large number of geographically distributed users can access the contents of large and diverse repositories of electronic objects[12]. The digital objects include text, images, maps, sounds, videos, catalogues and indices, business and government databases including hypertext, hypermedia and multimedia compositions[2]. In the electronic environment, the end users link to many digital libraries and information centres as well, conveniently in a transparent form through the modern technologies. The digital libraries also provide a homogenous presentation of a good number of repositories and allow the end users to seamlessly connect and interact with information irrespective of geographical location or time. The collection of information, graphics, images etc. in an electronic environment are disseminated without any geographical limitations in a digitized form through Internet which are accessed through the Network Services Provider (NSP) and millions of users connect their PCs through Digital Collections Service (DCS) using Local Area Network (LAN) technology to get a transformed and right information[10]. The schematic representation of Global Network (GNW) has been depicted on next page.



(Schematic Representation of GNW)

In the doorsill of IT revolution, the libraries and information centres, and archives have started new devices to preserve the information in digital form so as to make its effective use and transfer including its retrieval ability globally. The digital technology emerged from computer science laboratories and offered a stunningly efficient new means to store and retrieve information. By breaking analog information into coded elements– bits and bytes – the digital technology has made it possible to store information of colossal proportions using media which take very little space.

3. DIGITAL LIBRARY : ITS PRODUCTS AND SERVICES

IT development and its applications especially in the field of networking turned the shape of the world to a global village. Internet and World Wide Web (WWW) technology have provided a challenging environment and intellectual impetus for the development of digital libraries. The Internet is arguable electronic resource which have a tremendous and effective brunt on library services and operations and on the professional activities of librarians. The Information available clannishly in electronic form are stored in digitised bits which are used for,

(*i*) Electronics Mail (e-mail) ;

(*ii*) File Transfer (FTP)

(*iii*)Gopher ;

(*iv*) Remote Login (say Telnet)

(*v*) WAIS and WWW for information/electronic publishing and excess using the text coding standards such as Hypertext Mark up Language (HTML) and Standard Generalised Mark-up Language (SGML).

(*vi*) Electronic Journal (e- Journal);

(*vii*)Electronic News (e-News);

(*viii*)Table of contents;

(*ix*) Preprints;

(*x*) Technical reports;

(*xi*) Software and data archieves including library catalogues discussion forums, reference sources, courseware, directories etc.

Another successful venture of the electronic age is the electronic publishing (e-publishing) where the manuscripts are transferred to electronic format. The fusion of computer and communication technology with publishing can be termed as e-publishing which is available in machine readable form and the information, recorded on magnetic tape and video discs can be accessed like any other database[2]. The CD-ROM , Videodiscs and On- line bibliographic databases form a major part of e-publishing field. In the field of telecommunication Technology, the Integrated Services Digital Network (ISDN) is an Integrated Digital Network (IDN) where the digital switches including digital paths are used to establish a variety of services such as videotext, e-mail, digital facsimile, Teletext, database access, image and graphic exchange, audio and video conferenceing, storage and transfer of information etc[3].

4. PERCUSSION OF DIGITAL LIBRARY

The application of Computer and telecommunication technology has shaped the term digital library and the efficiency of information acquisition, processing, storing, quick retrieval including Electronic Document Delivery System (EDDS) has become more prominent and positive in recent years. The Digital Library is a distributed text based information system, a collection of distributed information services and a distributed space of inter

linked information or a networked multimedia information system[11]. The tremendous impact of the digital libraries has extended the capabilities on scholarly research getting access to a numerous networks required for research, publishing activities etc. The electronic journal (e-journal) has potential advantages over the one printed on paper which provide[5];

(*i*) More rapid publishing of research results through electronic submission of articles;

(*ii*) Network communication among authors, editors ;

(*iii*)More efficient dissemination of information through the matching of articles newly accepted into databases;

(*iv*) Innovative ways of presentation of research results;

(*v*) Electronic presentation of data and information through analog models, motion, sound hypertext, hyper media linkages etc.;

(*vi*) Cost effectiveness ; and

(*vii*)Speed of publication and cases of communication.

The online service through Internet arguably the electronic resource has a significant and important role in the system. The on line services include[5]:

- communication among staff through e-mail;
- sharing of information;
- support of reference services of all types through search of remote data bases;
- searching of catalouges of other institutions;
- information retrieval by the libraries for building SDI profile;
- inter-library loan facilities, document delivery;
- consortial file searching such as e-journals, images data, text file;
- availability of locally produced databases accessible to remote users ; and
- establishing home pages to provide information on the library.

In addition to the Internet, Intranet has also a significant role to make information and resources available in library and information centres to the user community under the same Internet protocol (TCP/IP). Further, the off-line services through various

modes also equally offer the services to the clientles through CD-ROM , Video Tapes, Floppy, Disks etc. which are all available in electronic form. The digital libraries could enable a direct interaction among the end users with the various networks and information resources in remote access areas without any hinderance. The Boolean search of full text through browsing made it a positive solution to the emerging problems of the scholars in the midst of ocean of information.

The colossal success of CD-ROM as the optical medium of choice for the thousands of publishing firms has led to the development of Optical Information Storage System (OISS) through CDs at par with publishing for its storage of good quantum of data, durability, crystal presentation and above all affordability. The major impact of the transfer of electronic information in the Digital Libraries is primarily concerned with quality, authenticity and realiability of information services. In addition to this, the mode of transfer of information could be more effective through electronic clipping services and electronic reference services in electronic environment[9]. The electronic preservation through selection, acquisition, organisation and the standardisation, creation of metabases, display technology are also the important components of impact of the digital libraries. The most significant contribution of the digital age in regards to e-governance is that, the digital certificates which are digital credentials are being awarded through a physical process.

5. CONCLUSION

A network through Local Area Network (LAN) and Wide Area Network (WAN) technologies connect two or more computers for the purpose of communicating data electronically and serves the important function of establishing a cohesive architecture that allows a variety of equipment types to transfer information in a near seamless fashion.

The digital libraries during the past couple of years have proved to be of a pragmatic value for research and development. The Internet, a cluster of electronic resource has changed the notion of library as a place without walls. It has been able to establish the creation of a new information environment – the digital library which at its base has the capability to retrieve, manage, store and publish information in numerous formats.

Yerkey[12], has defined digital library as electronic library in which a large number of geographically distributed users in various platforms can access the contents of large and diverse repositories of electronic objects which constitute, networked text, image, maps, sound, video, catalogues of merchandise and scientific, business and government databases including hypertext, hypermedia, and multimedia compositions.

However, there are the following three principal roles of the digital library such as :

- Storage of information in digital form and retrieval ;
- Usage of communication networks for information access and delivery ; and
- Online printing through downloading or off-line printing from a master file.

He has further advocated the reduction in physical storage of information which is an increase in housing of personnel collection development policy that focuses on filling users critical information needs rather than on building a comprehensive collection. The Internet has rightly built up the true image of digital libraries in shape of electronic storage of information, retrieval, document delivery, accessing of information through various databases, inter-library loan, acquisition, price control, transfer of files, transfer of information etc. The CD-ROM, Optical Video Disk (OVD) and other latest technological developments also made significant contributions for understanding and building the true image of digital library.

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65

Criteria for Digitisation of University Libraries in India

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ABSTRACT

The availability in electronic format of scholarly and scientific literatures and other forms of information in has profoundly altered the challenges faced by collection managers. Although the traditional goals of achieving quality, relevance, and balance at a fair price still animate most collection-development efforts, judgements about these attributes of resources have become more ambiguous. The traditional standards have also been joined by new and highly important criteria which include the definition of the allowable user group and the purposes for which use will be permitted, multi-faceted concerns about the functionality of resources, and concerns about the availability of permanent archives. Drawing heavily on the ideas of the multi-library consortia, which have grown up partly in response to the advent of electronic resources, librarians have devised new criteria and means of assessing resources so that cost-effective acquisitions can be made in the new marketplace.

1. INTRODUCTION

The collection to be converted and the digital technology to be used should be evaluated against some or all of the following criteria, depending on the degree of emphasis on collection development, access, and preservation options. Digital

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technologies have still not achieved stability adequate for preservation of analog materials when the digital version is intended to replace, rather than supplement, the analog version. The electronic or digital library is just beginning to take shape throughout the world, including the world of libraries. To talk about the electronic library in university requires a futuristic approach.

Digital Library encompasses two distinct components: learning related to accessing, evaluating, and using the information resources available in this environment and learning related to mastering and building upon the ideas embodied within those individual resources. Educators and system designers must draw upon research, theory, and practice from fields concerned with both these components in order to help library users to achieve the maximum learning benefits afforded by the digital library. Information studies provide insights primarily about the contextual and relational aspects of using the digital library, while instructional technology provides insights primarily about learning with the various media formats encompassed within this rich and complex resource. "Information literacy," an area that incorporates concepts from both areas, provides a useful overarching framework for considering the digital library as a learning environment.

2. SELECTION CRITERIA FOR DIGITISATION

The following criteria should be evolved for determining the selection of information for digitisation for access, rather than preservation, as digitisation is not yet judged to be an acceptable medium for the long-term preservation of print analogs. For digitisation of a university library one needs to consider the factors like staff, money and time to digitise. Besides these there are number of other issues to be considered by the librarians.

2.1 Licensing and Copyright Issues

The first and foremost concerns is what right one has to digitise? For any published document, it depends on the publication date. Generally, anything published at least 75 years ago is now in the public domain. For most published material less than 75 years old, and unpublished material, one must receive publication permission from the rights holder. Generally speaking, it is less costly to get permission to digitise unpublished or out-of-print material, but costs vary widely. Therefore, one has to check whether the

document is protected by copyright and whether the copyright is available easily and preferably at no financial cost.

2.2 Selecting Material

There should be enough related material available in one place to make the collection worthwhile to search or browse. No one wants to find only a few photographs, a couple of books, or a handful of manuscripts devoted to a topic. Therefore, one should overlook collection of three rare published volumes and focus on, for example, large collection of historical photographs.

2.3 Diversity of Material Type

It is also good to have a variety of material types united by topic. For example, an author's archive, along with published works, could include correspondence, photographs, manuscripts, and critical work. Such richness of material in one place attracts scholars and interested amateurs alike, as they can explore a person's work or a topic in a variety of ways.

2.4 Technical Requirements

i Sufficient hardware to digitise?
ii Sufficient software to digitise?
iii Adequate storage and preservation facilities in place?
iv Sufficient software and hardware to provide access to the documents, and can the documents be delivered at reasonable speed?
v Scanning equipment capable of delivering a digital product witch is as useful as the hard copy
vi Digital file can be viewed by at least one generally available viewer software package (e.g., HTML, JPEG, etc.)

2.5 institutional Criteria

Selection guidelines produced by individual institutions are understandably focused on the particular needs of that institution and its clientele. Selection criteria for digital imaging, considers the issues of technical feasibility, intellectual property rights, institutional support, and the value of the materials. It provides advice to government agencies beginning such projects, as well as for those seeking institutional grants.

2.6 Uniqueness

If one is going to spend a lot of staff time or money — at least one, may be both — and doesn't want to stumble across a rival then focus has to be on material that is unique to the library or that is highly unlikely to be digitised by others. Before digitising the library materials, following points are to be kept in mind :

- Does a digital version of documents already exist?
- Is the collection redundant to or complementary to other collections that will be digitised?
- Will the digital version make unique, local resources more widely available?
- Does the digitisation project provide greater currency of information?

2.7 Reputation

If the library has already established a reputation for a strong collection in one area, it shoud be build on digitally. The reputation as the prime source on an individual, a region, or a topic will only be enhanced by digital collection. On the other hand, one should try to avoid areas in which other libraries have better-known collections, unless a substantial digital presence can be established before others do. Never underestimate the power of a committed individual and a scanner.

2.8 Preservation

Digitising print material to preserve it is a questionable proposition at best. Nothing created or stored on a computer has lasted as long as a cheap paperback, if only because it hasn't had the chance. Computers have only been around for few decades; acid-free paper will last for centuries, even millennia. When we talk about digital preservation (which will be the topic of a future column), we must consider migration, preservation strategies, and long-term institutional commitment. We don't throw away the original after digitising it, then we have a good chance at increasing the odds that the material won't disappear by creating a digital copy.

2.9 Audience and Potential Use

It's hard, expensive work to create digital library collections and

services. Before embarking on a project, we should be sure to know the target audience and what they want. If you build it, they might not come. And if they come, the materials must be presented in ways that encourage and support exploration and use.

2.10 Available Support/Revenue Opportunity

In the end, one of the most crucial factors is funding. While this may sound crassly opportunistic, it is also realistic. Any library will only have limited (if any) funds to devote to this activity. But we would do our library a grave disservice if we ignored the opportunity to obtain grant support. Such a collection may not be the first choice, but something is better than nothing.

2.11 Ease/Difficulty/Expense

There are several different ways to digitise material (another subject for a future column). Virtually none are easy and inexpensive. Therefore, the relative cost or difficulty may provoke you to alter one selection.

3. LITERATURE REVIEW OF DIGITISATION

The study made at Libraries of Texas was devoted to the topic of digital libraries, archives, digitisation, scanning and XML[1]. While the study made by Smith revealed the basic principles of the digitisation of library materials and the reasons why the process cannot yet be regarded as being synonymous with preservation and also discussed the advantages that can be derived from digital conversion projects[2]. Library Association Multimedia Information and Technology LAMIT NorthWest Group in Liverpool, UK, reports the digitisation of library special collections, an event organised on 18 March 1999 and discussed the various aspects of building digital libraries of the future; Digitisation and archives: new technology and the local history collection; National Archives Network and the software suppliers' approach to customer digitisation of special collections[3].

The Colorado Digitisation Project (CDP) is a collaborative initiative of Colorado's archives, historical societies, libraries and museums to create a virtual collection of Colorado's special collections. During the first phase of the project the collaborator identified existing digitisation projects, conducted a pilot project and created a Website http://coloradodigital.coalliance.org. The

CDP represented the first statewide implementation of standards for digitisation and creation of metadata[4]. Similarly in the Canadian digital library initiative comprising of 20 Canadian libraries, has formed the Canadian Initiative on Digital Libraries to work together to improve access for digital resources. In addition to fostering cooperation within the library community, the initiative will establish liaison and collaboration with other sectors involved in Canada's electronic information infrastructure[5]. Renmin University, Beijing, 27 Aug 1996, presented the tentative ideas and practices of the library of the Chinese Academy of Social Sciences (CASS), in the field of digitisation and networking as first step in the transition from traditional library to electronic library. It also deals with the overall plan for digitisation of library materials and identifies a model of information exchange for CASS which can be applied to the establishment of the CASS electronic network[6].

Library of Congress with special reference to the American Memory Project, a digitisation of certain of the LC's historical collections offers the American people a chance to explore their country's cultural and historical resources through words, images, and sound. It also considers the wider role of the LC in the creation of the National Digital Library; its role in developing new approaches to organising, managing, and preserving digital material; the need to create procedures for the protection of intellectual property; and the need to acquire resources to convert current collections to digital formats[7]. The Digital project conducted by Cimtech, Hertfordshire University, UK, was focused on three vital areas mainly the digitisation of microfilmed library materials; the digitisation of printed library materials; and the exploitation of both using optical character recognition (OCR). Besides, comparison was made with information originating and published in digital form[8].

The projects carried out at UK and USA explain, digitisation process and describes document and microfilm scanners and details scanning of print and microfilm, explaining the different problems and special needs of each medium[9]. The study carried out by Hendley and Robinson to investigate the digitisation of microform library materials and printed library materials and also the exploitation of using Optical Character Recognition (OCR) including Intelligent Character Recognition (ICR) technology[10]

Several other libraries and institutions have attempted to provide assessment and selection criteria for proposed digitisation projects. Wherever possible these have been studied and used for this report. These include:

Columbia University's 'Selection Criteria for Digital Imaging Projects', http://www.columbia.edu/cu/libraries/digital/criteria.htm
'Guidelines for Selection' compiled by P. Ayris (UCL) as part of the joint RLG and NPO Preservation Conference, Warwick, 1998
Questionnaires drawn from the RLG's Digital Preservation Needs Assessment Sheet [24th April, 1998]
Harvard University's 'Selection for Digitizing: A Decision-Making Matrix', http://preserve.harvard.edu/resources/digitisation/selection.html
University of California's 'Selection Criteria for Digitization', http://www.library.ucsb.edu/ucppp/digselec.html

Guidance for Selecting Materials for Digitisation
http://www.rlg.org/preserv/joint/ayris.html

Moving Theory into Practice Digital Imaging Tutorial: Selection
http://www.library.cornell.edu/preservation/tutorial/selection/selection-01.html

Selecting Research Collections for Digitization
http://www.clir.org/cpa/reports/hazen/pub74.html

Selection Criteria for Preservation Digital Reformatting
http://lcweb.loc.gov/preserv/prd/presdig/presselection.html

4. CONCLUSION

The electronic or digital library is just beginning to take shape throughout the world, including the world of libraries. The value of the materials' content and the benefits derived from access to digital versions must justify the expenditure of the time and effort of carrying out a digitisation project. It is expensive to select, create and maintain digital resources and is, therefore, important to ensure that issues involved in digitisation, add intellectual content, historic and physical value and provide information on subjects that are otherwise poorly documented. Further, it should

be based on curriculum to support teaching, learning and research activities of the university. Digitisation may also, generate university prestige by enhancing and promoting strengths of current collections.

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66

Digitisation of Manuscripts at Osmania University Library

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ABSTRACT

Osmania University Library has a collection of 6428 manuscript documents in diffrent languages in palm leaf and paper formats. Special features of teh manuscrips such as illustratins, calligraphy, scrip, and subject coverage are described. The manuscript date between 11th and 18th century. Digitisation is useful for the preservation of the manuscripts and it enhances easy access.

1. INTRODUCTION

According to Harrod's Glossary, 'Manuscript' is a document of any kind which is written by hand, or the text of a music or literary composition in hand-written or typescript form, and which, in that form, has not been reproduced in multiple copies. Manuscripts are invaluable sources for the reconstruction of the history and cultural heritage of the country. Great ancient scholars dedicated their lives for creating written records of knowledge. Manuscripts exist in various forms. Apart from stone, iron and copper engravings, manuscripts are also on parchment, papyrus, palm leaf, vellum, cloth and paper. The Osmania University Library has a rich collection of manuscripts.

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2. MANUSCRIPTS COLLECTION AT OSMANIA UNIVERSITY LIBRARY

The Osmania University Library has a manuscript collection of 6428 documents comprising many languages and varied subjects. The following table shows the details of the manuscript collection at Osmania University Library.

Table-1. Details of Manuseript Collection

Sl. No.	Language	No.of Manuscripts	Type of Manuscript
1.	Sanskrit	2059 1555	Palm leaf and paper Mss.(504 Telugu script and Devanagari script)
2.	Arabic	1673	Paper (Arabic script)
3.	Persian	1371	Paper (Persian script)
4.	Telugu	337	295 palm leaf and 42 paper Mss. (Telugu script)
5.	Urdu	369	Paper (Urdu script)
6.	Kannada	295	71 palm leaf and 224 paper (Kannada script)
7.	Tamil	140 65	75 Palm leaf (telugu script) and paper(128 Telugu script and 12 Tamil script)
8.	Marathi	131	Paper (Devanagiri script)
9.	Hindi	47	(Devanagari script)
10.	Turkish	5	Turkish script
11.	Hebrew	1	Hebrew script
	TOTAL	**6428**	

2.1 Historical and cultural background

Some of the manuscripts originally belonged to the Royal families. The seals and endorsements on the title pages give proof of this fact. Among them are Kitab-as-Sahih which was in the Royal Library of Emperor Akbar, Qamus al-Muheet which was in the Library of Adil Shahi Kings and Kulyat-I-Urfi which was in Tipu Sultan's Royal Library. Another factor of the

collection shows how Hindus were interested in Persian works. Many Hindus were also poets and writers in Persian and Urdu. The poetical collections of Maharaja Chandulal Shadean, the Diwan of the Nisam-III, Shahnama of Moulchand, and Maathir-I-Asafi of Lakshmi Naraian Shafiq are the best examples of this fact. It appears that the Hindus also learnt Persian calligraphy. We found that some manuscripts of the collection were transcribed by the Hindu calligraphists like Kanahiya Lal Shahjahanbadi, Rupechand, Pandit Shankernath etc.

2.2 Some Special Features

Some special features of manuscripts at Osmania University Library relate to: (*i*) Illustrations (*ii*) Calligraphy (*iii*) Script and (*iv*) Subject coverage

Illustrations: There are a few illustrated manuscripts in the collections. Especially they are found in Arabic, Persian, and Sanskrit collections. The illustrations comprise gold ruled margins, floral designs, and illuminated miniature paintings. The miniatures represent different schools of art, the Hindu, Iranian, Adil Shahi and Mughal art. These paintings are mostly found in the epics. Three manuscripts in the Sanskrit collection are richly decorated with splendid floral designs and miniature paintings. Each page contains quite a different floral design on the border.

Calligraphy: A striking feature of the collection is the mastery shown in calligraphy work. The manuscripts have been transcribed by some well-known Calligraphists like Ustad Abdul Karim, Fateh Muhamad, Abdur Rahman al Quraishi, Abdu Baqa Musavi and Kanahiya Lal Shahjahanbadi.

Script: It is Interesting to note that many Sanskrit and Tamil manuscripts are written in Telugu Script.

Subject coverage : The subjects covered by these manuscripts are varied Philosophy, Puranas, Dharma Sastras, Music, Astronomy, Lexicography, Medicine, Poetry, History and Biography are some of the subjects dealt in these manuscripts.

3. DIGITISATION OF MANUSCRIPTS

The manuscripts of the collection date between 11th and 18th century. They are too fragile and precious to be exposed to public handling and are slowly decaying and vanishing due to improper

handling. Indeed, preservation of manuscripts presents a great challenge before us. The technology of microfilming is cumbersome, and the output is difficult to use. However, fortunately information technology is offering many solutions not only for the preservation of these documents, but also for their enhancement and access. One such solution is digitisation.

Digitisation refers to the conversion of an item—be it printed text, manuscript, image or sound, film and video recording—from one format (usually print or analogue) into digital. The process basically involves taking a physical object and essentially making an "electronic photograph" of it. An image of the physical object is captured - using a scanner or digital camera - and converted to digital format that can be stored electronically and accessed via a computer.

3.1 Digitisation Methods

Digitisation requires a basic process, which involves different sets of hardware and software technologies at each step. Determining the appropriate technology is directly linked to the anticipated use and purpose of the material being digitised. For digitising the text and other materiel, following five methods can be used.

a) Manual data entry

b) Scanning

c) Optical character recognition (OCR)

d) Pattern recognition technologies

e) Document imaging

Manual data entry

In the simplest method of converting an image of a page (or the real page of text) into digital text is to enter it manually. This is usually a time consuming method but very useful from the point of view of information retrieval.

Scanning

In the second method, scanners are used to take digital pictures of objects. Scanners can be simple desk top machines or very large and complex systems that process thousands of documents.

Optical Character Recognition (OCR)

This process uses Optical Character Recognition (OCR) software, which takes a picture of the page and then turns it into digital text, which can be edited or fully indexed. OCR software must distinguish between black and white areas of text.

Pattern Recognition Technologies

These are next generation of OCRs, represented by Pixie, a product being developed by Excalibur Technologies. This software uses a technology called Adaptive Pattern Recognition, which attempts to mimic aspects of the neural patterns of the brain. The software can be taught to recognise variations and relationships in pattern, such as patterns of text rather than readable text. The retrieval of search terms uses what Excalibur Calls "Fussy Matching".

Document Imaging : Document imaging is a simple method of capturing text and graphics. It involves taking an electronic picture of each page of text along with pictures, if any with the same type of scanner as one would use for OCR. However, the difference is that the images are stored as graphic files rather than text files. A similar technology is used for fax transmission. Each page is stored as one picture. The text on the page cannot be edited or indexed.

3.2 Hardware and Software Required for Digitisation of Manuscripts

3.2.1. Hardware

a. *Computer:* Latest configured system with having high speed and more optical storage memory with CD-ROM Drive/Writer

b. *Digitising Devices*: convert photo artwork and raw materials of the real world into digital data that can be edited by graphics programmes. The most common digitising devices are:

i) SCANNER: Scanners are primarily used to digitise photographs, artwork and slides. They come in all shapes and sises. Some produce sharp, high quality images while others produce only acceptable images for positioning purposes. There are many types of scanners like Flat bed scanner, Slide scanner, Rotary drum, Quick document scanner, etc.

ii) DIGITAL CAMERA: Digital camera digitises image

on a click of button, often storing image to a tiny hard disk or battery powered memory chips. The images are then downloaded to a computer through a cable connected to its SCSI or serial port or they can be send to a computer over the telephone lines.

iii) OUTPUT DEVICES: Printers, Modem and CD Writer are the output devices.

3.2.2. Software

There are a number of Softwares, which can be used for different functions such as:

- Image editing programmes
- Page layout programmes: to integrate text and graphics
- File transferring utilities: to share files between computer platforms
- File translation programmes: to convert files from graphics
- File compression software

The recommended softwares are Adobe PhotoShop, Paintshop Pro, FrontPage, Imaging Professional Software, etc.

4. DIGITISATION OF MANUSCRIPTS AT OSMANIA UNIVERSITY LIBRARY

The Following steps are used for digitisation of Manuscripts:

(*i*) Scanning the original manuscript folios

(*ii*) Converting image into .jpg format and preserving the same

(*iii*)Preparing an index.

(*iv*) Hosting on to Library's Home page (within LAN) under Manuscript Section.

5. CONCLUSION

The ancient texts, paintings and similar artefacts are part of national heritage. Conservation apart, the technology of digitisation can help to restore the pictures and paintings and bring these back to their pristine glory.

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67

Role of Cryptography in Information Handling

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ABSTRACT

The paper describes cryptography, the best information secrecy mechanism practised since the days of Roman Empire and its role in strengthening the security of information both in transit and storage. The paper summarises Data Encryption Standards (DES), International Data Ecryption Algorithm (IDEA), Public key cryptographic systems, the Rivest, Shamir, Adelman (RSA) Algorithm etc. Any break of DES has not been reported despite its widespread use though critics point out that the key of DES is too short which makes it susceptible to brute-force attack. In e-mail, encryption is used as "envelope". Digital signature, an application of cryptography which establishes the sender's authenticity and ensures secrecy of message is explained. The paper points out that strength of Cryptographic system rests not on the algorithm but on the security of key.

1. INTRODUCTION

Information, the product of brain, is the power, the basis of decision making for managers, planners, statesmen, administrators, etc. Technological advancements which enable transmission of highly confidential vital Information between geographically distributed sites could lead to leakage from eavesdropping and wiretapping. This in turn directs the need for data encryption

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before transmission of data.

2. BASICS OF CRYPTOGRAPHY

Cryptography is the best information secrecy mechanism practiced since the days of Roman Empire for the security of information both in transit and storage. The aim of encryption is to avoid the interception and strengthen the security by turning the intelligible data into gibberish. It is based on two things : an algorithm and a key. An algorithm is a mathematical transformation. It transfers plaintext into ciphertext and *vice versa*. A key is the random bit string – sometimes a number, an ASCII value, or sometimes a word or phrase that is used in conjunction with an algorithm.

The original unenciphered text is called the plaintext or the cleartext. It can be encrypted using some encryption method parameterised by a key and the result is called *ciphertext*. Plaintext can be obtained by decrypting the unciphered message using the decryption key. The sender must know how to encrypt the data and the receiver should know how to decipher the coded message.

A cryptographic system that uses the same key for both encryption and decryption is said to be *symmetric*, and that uses different keys at the two ends is said to be *asymmetric* schemes.

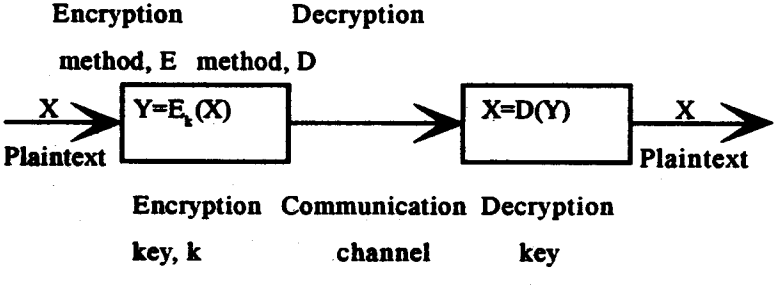


Figure 1. Basic Model of cryptographic system

One of the first know cipher which belongs to a more general class of substitution ciphers is attributed to Juliums Caesar and is called Caesar Code. It is based on substitution of each letter with a letter that comes three places later in the alphabet. For example, using the English alphabet and converting to upper case the plain text 'Buddha' would yield the ciphertext 'GXGGKD'. A *substitution cipher* operates by replacing each symbol or a group of symbols

in the plain text by other symbols in order to disguise the original. Cryptanalytic attacks on substitution ciphers usually exploit the known letter frequencies in natural languages. A further level of sophistication in substitution ciphers is to conceal the frequencies of individual letters in the cipher text by using multiple cipher alphabets in rotation. This class of ciphers is called *polyalphabetic ciphers*. In general, substitution ciphers are comparatively easy to break, as they are susceptible to statistical attacks. Now with the additional help of an online dictionary, this attack can be mechanised and executed.

The art of breaking ciphers is called *cryptanalysis*. The job of cryptanalyst is to find the weakness in an algorithm that allows to recover plaintext messages without the key. There are three basic code-breaking attacks.

- A ciphertext attack : A cryptanalyst comes into possession of some ciphertext with an algorithm. He/she knows only the algorithm. His/her job is to find out corresponding plaintext without knowing the key.
- A known plaintext attack : A cryptanalyst has some matched portion of the ciphertext encrypted with an algorithm, and the corresponding plaintext. He/she does not know the key, but he knows the algorithm. His job is to find out the key to decrypt the remaining ciphertext.
- A chosen plain text attack : This is the most dangerous attack in which the intruder has the ability to encrypt pieces of plaintext at will.

Brute-force attack

This is known plaintext attack. The most obvious way to break an algorithm is to try all possible keys. With the encryption algorithm known, the computational speed of computer can be used for Brute-force attack in which the entire key space is searched exhaustively in a comparatively short time. The best way to prevent this attack is to make the attack very expensive, both in time and money so that no one would consider of launching it.

3. MODERN ENCRYPTION ALGORITHM

The messages are usually encrypted using anyone of the following algorithms:

- One time pad
- Data Encryption Standards (DES)
- Triple DES
- International Data Encryption Algorithm (IDEA)
- Public – key encryption scheme

3.1. One Time Pad

Substitution cipher, which uses a long nonrepeating key, is called *One time pad.* Words from a book starting from a specific place known to both the sender and the receiver can be used to form it and it gives no information to the cryptanalyst. The code used for ciphering can be quite complex since the computers at both ends can be used to cipher and decipher. The drawback of substitution ciphers is that there must be an initial transmittal of the code that is to be used by the recipient, over the insecure network channel. For absolute unbreakability, the code has to be as long as the message that is transmitted. It is extensiely used by spies because of its absolute security. The hotline between Moscow and Washington was encrypted with a one time pad for many years.

3.2. Data Encryption Standards (DES)

Data Encryption Standards (DES) was originally developed by IBM and was adopted by the US National Bureau of Standards (NBS) in 1977. The DES algorithm operates on 64-bit (8 byte) blocks of input at a time. It means that the algorithm accepts 8 bytes of plaintext and spits out 8 bytes of ciphertext. The encription process is parameterised by a user-supplied 54-bit key. (In the origianl proposal IBM suggested the use of 128-bit key). Thus the key space contains 2^{56} possible combinations. DES is a symmetric cryptosystem which has been implemented in hardware. It is a relatively easy means to both encipher and decipher data. In fact the DES algorithm is structured in such a way that the decryption process is the exact reverse of the encryption. Though its algorithm is well-known and publicised, the encryption key is kept secret, which makes it very difficult for any one who does not know the key to decipher the message. No break of DES has been reported despite its widespread use in commercial world.

The drawback of this scheme is that encryption key has to be transmitted to the recipient before a message can be transmitted.

Critics points out that the key of DES is too short which makes it susceptible to brute-force attack. It is estimated that a DES-cracking machine would cost some 20 million dollars to build and the cost of breaking an individual key would be around $ 5000, which is economically unprofitable for the prospective data pirate.

3.3. Triple DES

Triple DES is a simple variant of DES that encrypts the message three times, one after the other. Encryption with a different key at each time can result in an algorithm that is far more secure than DES.

3.4. International Data Encryption Algorithm (IDEA)

International Data Encryption Algorithm (IDEA) was invented in 1991 by James Massey and Xuejia Lai of Zurich, Switserland. The algorithm is Xuejia Lai's Ph.D thesis. IDEA has an 8 byte block sise and a 128 byte key sise. Pretty Good Privacy (PGP), the most popular e-mail security program 2.0 and its later versions use the International Data Encryption Algorithm.

3.5. Public Key Encryption Scheme

Public Key Encryption Scheme provides both the encryption key and encryption algorithm public and is readily available. There was two different keys: one for encryption and the other for decryption. They come in pairs as a specific encryption key (public key) that works with a specific decription key (secret key). The public key is public. Anyone can have a copy of it. This allows anyone to send a message in a coded form. As the decription key is secret, only the rightful recipient can decipher the coded message. This decryption key is called the private key.

Some of the public key algorithms are :

- Rivest, Shamir and Adelman (RSA) algorithm
- ElGmal
- Knapsack algorithm

3.5.1. Rivest, Shamir and Adelman (RSA) Algorithm

RSA algorithm is one of the best and widely used Public Key algorithms. It was invented by a group of researchers – Revest, Shamir and Adelman – and named using their initials (RSA). In

their scheme each member of a group who wants to securely communicate devises her/his own trapdoor function with its forward and reverse transformation algorithm. A directory containing the forward encoding algorithm of each member of this group is published in a pubilicity accessible directory. As the forward algorithms are public, anyone can consult the directory and using the published forward algorithm of a member of this group and can send an enciphered message to the member. Only the recipient knows the reverse algorithm, which is kept secret and is able to decipher the coded message.

4. DIGITAL SIGNATURES

Digital signature is one of the most important applications of cryptography, which can prevent spoofing. Spoofing is the problem of one person impersonating another. *Digital Signature* is a sequence of bits appended to a digital document in a manner that is unique and traceable to the originator. Like ordinary hand-written signature, it is supposed to establish the sender's authenticity. One person impersonating as another by forging header on top and wirting his/her name at the bottom can send an incriminating e-mail message. In e-mail, encryption is used as "envelope".

Digital signature may be implemented in conjuction with the use of RSA Public-key encryption to ensure both authenticity and the security of the message. Both the sender and the receiver must perform a double transformation of the message in this mode of operation. The sender first applies his/her own private key and then enciphers the result using receiver's public key. This doubly formed message is sent to the receiver. The receiver first applies his/her own private key to decipher and then applies public transformation to obtain plaintext. The receiver can store the intermediate appearance of the message after decryption with its private key to verify the legitimacy in case of dispute. This particular method of digital signature even in its simpler incarnations imposes significant computational overheads by requiring a four-way public key transformation, which is time consuming. Further, this is unsuitable for applications where authenticity is required and secrecy is not permitted as it couples secrecy and authentication.

4.1. Pretty Good Privacy (PGP)

Pretty Good Privacy (PGP) is one of the most popular e-mail security programs, which uses Public Key Cryptography. It was introduced in 1991 and is available free of charge on the Internet. It works on a large variety of hardware platforms. It is relatively easy to use and gives privacy and authentication to users.

4.1.1. Security Features of PGP

The important security features that PGP provides for e-mail are:

- Message integrity
- Confidentiality
- Data origin authentication
- Nonrepudiation of origin

The message integrity assures that the contents have not been modified in transit. Confidentiality protects the contents of e-mail against unauthorised disclosure. Non-repudiation of original feature allows anyone to verify the identity of the original sender of a forwarded message. It is also possible to send a PGP protected message without providing confidentiality though it is designed to automatically provide confidentiality, authentication and integrity for all messages.

4.1.2. Cryptographic Algorithms of PGP

PGP uses Public Key Cryptography for key management, Conventional (secret key) for data encryption, and a one-way hash function for digital signature. The algorithms of PGP version 2 are:

Data Encryption Algorithm	:	IDEA
Key Management Algorithm	:	RSA
Message Integrity Check and Digital Signature Algorithm	:	MD5 and RSA

4.1.3. PGP's RSA key grade

- Casual grade (384 bits)
- Commercial grade (512 bits)
- Military grade (1024)

Out of the above three key grades 1024 key has the highest

security and is unbreakable.

4.1.4. Procedure of sending PGP Message

The sender can digitally sign PGP message by using the MD5 hash function and RAS public key encryption. Four steps involved in sending the messages are:

- Signing (optional)
- Compression
- Encryption (optional)
- Transmission encoding (optional)

First of all, PGP generates the MD5 hash value of the message to create a digital signature. Then this hash is encrypted using the sender's private key and finally the encrypted hash is added to the message. After signing the message, it is compressed to reduce the sise before tranmission.

5. CONCLUSION

The best way of protecting data to be transmitted is the application of cryptography, the strength of which in turn rests not on the algorithm but on the security of the key. The computational complexity of encryption and decryption should be reasonable as they represent processing overhead that increases communication delays. In order to withstand the attacks one should use encryption algorithms that are free from statistical and mathematical weaknesses and that are computationally infeasible to break according to the intensity for security.

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68

Wither Away Indexing? The Impact of Internet on Subject Indexing and Information Retreival

R.S.R. VARALAKSHMI *

ABSTRACT

The Internet has brought the world to the people and facilitated 'do it yourself searching'. It has opened floodgates to a deluge of unsifted information bypassing the traditional controls provided by the publisher-reviewer and the indexer-controlled vocabulary process in the print world resulting in inefficient information retrieval. The paper tries to identify the advantages and limitations of traditional and Internet indexing techniques to access scientific and academic information. It emphasises the need to adopt the best aspects of the two for effective retrieval.

1. INTRODUCTION

Indexing is still the basic tool for bibliographic organisation and information retrieval in libraries. The purpose of indexing is to construct representation of concepts in the documents in a form suitable for inclusion in some database *i.e.* in print, card or electronic form. The index systems have undergone many tests for their compatibility with information storage and retrieval system. The new technologies accord ample opportunity to improve the schemes for automated environment. For example, the Dewey Decimal Classification Online projects; provision for online searching in UDC; Online Public Access Catalogues (OPAC) have versatile and powerful organisation and searching capabilities. Thus even in the present information age indexing services are essential and relevant to help information retrieval.

However, the Internet to a considerable degree has affected

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these systems, in spite of their eternal characteristic. Now it is often commented that classification and subject indexing have no place in the contemporary information retrieval systems especially with the emergence of Internet that made the world a global village.

The paper analyses the indexing strategies before and after Internet and the future perspectives. It suggests the way out to resolve the lacunae in the existing systems and evolve the best of indexing practices.

2. ORGANISATION OF INFORMATION BEFORE INTERNET

While discussing indexing, one starts with back-of-the-book indexing, metamorphosed as cataloguing; subject indexing; and database indexing. The objective, in any method is to scan, review, analyse and select subject components and represent them as index terms for matching and retrieval of user request. Subject indexing involves two principal activities: *i)* conceptual analysis, may be document oriented or request oriented *ii)* translation involving conversion of the conceptual analysis into a set of index terms. The indexing techniques have been modified and revised from time to time to synthesise or put the components in order, either pre-or post-coordinated. Indexing has been considered as an art as there are matters of judgment, selection and style of presentation in making information accessible. Thus, prior to Internet the libraries and information centres have well-established practices of indexing. The basic characteristics of information environment prior to Internet are:

- Most of the material is either in print or multimedia, acquired and stored in the library to a maximum extent.
- Access to external information is available through national and international information systems or networks with the help of secondary database.
- Full text electronic publications are not prevalent except for few compact discs (CDs). Online full text serials are limited with more emphasis on index and abstract databases of serials.
- The print and publication industry has a long history of sifting, reviewing and editing, resulting in limited quantity and relevant information to offer.
- Organisation and retrieval of information is through classification, subject catalogue, subject indexing and

controlled vocabulary. These are created according to specific rules and structural and content standards such as AACR, MARC, LCSH, Thesaurus etc. to achieve quality and consistency of indexing.

- Title based indexing, catchword indexing, citation indexing, automatic indexing and extracting, content analysis are also applied as per the requirements.
- Sophisticated search languages and subject access through controlled vocabulary offered efficient and fast searching capabilities with high precision ratio.
- Search is carried out by an intermediary to save the time of the user.

3. THE INTERNET ERA

Internet has brought the world to the people and facilitated 'do it for yourself searching'. It has opened floodgates to a deluge of unsifted and un-edited information. The WWW has emerged as a goldmine for subject access to information and documents on the Internet and is growing exponentially. It consists of many files across the world. There are millions of Web pages and databases. It is inevitable for libraries and users to access Internet to browse major part of electronic documents.

3.1 Organisation of Information Resources since Internet

The Internet has an impact on three important and related fields *viz.* publishing, indexing and access / retrieval. The important characteristics of Internet era includes:

- Authoring has increased as any one can publish on the Internet without any consideration to quality. Hence the size and variety of Internet resources is very vast with millions of web pages, Gopher sites, FTP sites, use nets etc.
- Academic journals and electronic books have appeared on the Internet which have reduced problems of document delivery.
- Automatic keyword indexing from the full text or KWIC and KWAC indexes from title are made available.
- Search engines are developed that operate by creating indexes to the network resources by automatic indexing using Boolean approaches.

- Much of the network accessible text is presented in highly structured HTML format that can exploit full interlinking capabilities of the web.
- The access environment is continuously changing; new sites emerge and some others disappear in no time: new facilities are added almost on a daily basis.

3.2 Indexing and Internet

"There is wealth of options available for today's Internet searcher. Computer-driven search engines offer the ultimate in depth of indexing by completely crawling through Websites and compiling full-text databases. Internet directories present a more disseminable record structure by cataloging sites within a hierarchical classification scheme"[1]. This has made indexing on Internet both simple as well as complex.

Several approaches are currently used to index the Internet resources such as software tools designed to allow users to perform relatively specific subject searches of these resources; the search engines; subject directories, subject guides/ gateways etc. The search engines operate by building indexes to the network resources, by automatic indexing of text / abstract using Boolean approaches. Basically these are crawler-based (HotBot), Human–powered Directories (Yahoo depends on Human for its listing), Hybrid or Mixed results search engine services. The roving robots crawl website for a Deep crawl, Frames support, Image maps, Meta robots tags[2]. Generally they apply stop list, to eliminate words not indicative of subject. They are considered to be 'Intelligent Agents' having limited learning capability. Different search engines offer different capabilities such as use of Boolean logic, phrase match, truncation of words etc. All the major search engines claim that they index for full body of text with Meta Descriptions, Meta keywords, Alt text, Comments and Stemming. Most search engines offer ranking of search output, based upon several criteria like position of words in the text, frequency of key words on a web page etc. as the basis of ranking in response to a query. The exact mechanism is slightly different for each engine. Some engines provide a relevancy boost *e.g.* Meta Tags Boost Ranking etc. There are about 32 search engines to find information on web like Alta Vista, Ask Jeeves, eXcite, Fast search, Google, HotBot, Yahoo etc.

The proliferation of search engines within the Internet lead to the emergence of several meta search engines for parallel search, like Savvy search, Galaxy, The Argus clearing house, All-In-One Search Page etc. *e.g.* Savvy Search covers nineteen search engines. They are obviously slower but have valuable performance in searches where complete results are needed. Metadata are about information objects. 'Information objects regardless of physical or intellectual form they take have three features—content, context, and structure—all of which can be reflected through metadata"[3]. 'The structured document facilitates searching, manipulation, and interacting with other information objects. Capturing, documenting and enforcing the structure requires specific types of metadata'[4].

Meta tags are used to define metadata and are mainly design elements that give the builder of the web page the ability to determine what is to be indexed. Two important meta tags for search engine indexing are the descriptors and key word tags. They provide a useful way to control the text / summary and frame pages in some search engines (not all). They will boost the relevance of text. Further Meta Robots tags will be added to specify the search engine the page that is not intended for indexing and to keep the spider out. Metadata element sets, conforming with national and international standards will offer increased accessibility, retention of context, expanding use, multi versioning, preservation, legal issues, system improvement and economics[5]. The standard formats such as MARC21, USMARC, Dublin Core, EAD, GILS, FGDC provide content standards for metadata. They facilitate mapping between common data elements. Such metadata standards ensure that different kinds of descriptive metadata are able to inter operate with each other. For example Dublin Metadata Core Element Set was devised as a simple set of 15 data elements to facilitate discovery of electronic resources by providing a common core of semantics for resource description. The Core Elements are Title, Creator, Subject, Description, Publisher, Contributor, Date, Format, Identifier, Source, Language, Relation, Coverage and Rights[6].

Thus, different approaches to indexing of Internet resources are developed on the basis of standards. The usefulness of this indexing structure has attracted many professionals and evaluative studies have been conducted on this aspect. These developments have raised several questions on indexing. As Mc Dougall[7] puts it

'How far will human indexing be required? How will indexing techniques have to change to stay relevant? What is the future role of indexers that include classifiers?' are some of the questions which demand answers. On the other hand there are critiques that find limitations in the indexing of Internet resources.

4. STUDIES AND EXPERT OPINIONS

Several evaluations or comparisons of search engines with a list of criteria have been done. Jacob (1995)[8] Scales and Felt (1995)[9] The Cataloguing and Indexing Group of Scotland (1996)[10] Nicholson (1997)[11] have studied the capabilities of search engines. European Library Automation Group (1996)[12] observed that "Academics reluctant to make the move to electronic publishing often complain that the Internet is littered with rubbish: with mountains of trivia and a sea of information, within which serious scholars struggle to find anything of real value. Part of this claim is true: there is at present a great deal of shallow, inaccurate, poor quality writing on the Internet. However there is also some material available in electronic form equal in quality in almost anything published in the print world"[13]. Peterson (1997)[14] compared eleven features of eight robotic Internet search engines and identified their strengths and limitations. He stated that 'replace call numbers with URLs assigned to each document. Dispose those arbitrary and finite categories in the card catalogue.' Jansen, James (1996)[15] observed that the current search and retrieval engines are passive instruments. Intelligent agents may be the way to improve search and retrieval engines, making them active personal assistants. Bipin C Desai (1997)[16] opined that "The search interface provides little flexibility and the results obtained are varied.... The reason for the uneven result is due to the fact that many of these search systems attempt to match the specified search terms without context as to where the words appear in the target information source". Dutch academic user survey, conducted by Henk J Voorbij,[17] on 1000 members of academic community and three focus group interviews with faculty members revealed "The WWW is being used primarily to search general, factual, ephemeral or very specific information. At this time full text resources play only a minimal role in the academic research process. Therefore academics regard the WWW as an extra facility not as a facility that replaces printed information"

A study of web users by Jansen et al (1998)[18] proved that searchers seldom use the available tools to have search statements, such as Boolean operators or quotes to form phrases. Harter[19] measured the impact of E-journals applying the method of citation analysis and found that the impact of E-journals on scientific communication has been minimal. Carol Casey (1999)[20] while exploring the need for analytical indexes emphasized that it is impossible to have a comprehensive analytical index to the Internet. She has suggested for the creation of small, focused indexes as the best solution for accessing specific type of digital information. Koehler, Jr. (1999)[21] opined that off- the- shelf technology allows monitoring web sites and web pages. Though capturing semantic or meaningful change is more complex, these can be approximated using Internet software. However he concluded, "these processes are in the end no substitute for human judgment. They do, however, provide access points, filters, and flags for the cataloguer, the scientist and the end-user."

Neelameghan (1999)[22] opined that the problems relating to information and indexing, organisation and vocabulary control in databases accessible on the Net are not dissimilar to those faced in online access through remote databases like Dialog etc. He has categorised the factors into database related; browser / search engine related; and browser / search engine user related. Shalini Urs and Raghavan (2000)[23] while over viewing the metadata formats remarked that publishers of electronic information on the Internet would need to incorporate metadata into their publications. Hence there is a need to identify minimal set of core metadata elements for publishers and comprehensive formats for providing detailed description of electronic resources on Internet.

The studies and expert opinions clearly indicate that subject searches on WWW are not without difficulty. The problems can be identified as:

- The most severe problem seems to be the large amount of irrelevant hits. Thousands of items are being retrieved even for specific search.
- The Internet environment is changing rapidly; new ones emerge and some others disappear almost on daily basis.
- The URLs may be changed for any particular item and the hyperlinks may also change frequently.

- A serous problem identified by many is lack of quality and consistency. Maintaining the quality of information, weeding out the garbage of millions of items is difficult.
- Difficulty to find reliable information as there is no quality control measure like reviewing. Hence it is difficult to weigh the relevance.
- Search only by subject and not through other elements. It is difficult to handle synonyms and homonyms.
- Most of the literature available is ephemeral which may not be required for scientific communication.

Lancaster[24] has identified the following additional problems of indexing and retrieval on web:

- The web-based agents can generate substantial extra loads on servers that may already be overloaded.
- If the agent is responsible for breach of copyright, is the user legally responsible or the manufacturer?
- As the authors and companies are more concerned with retrieval and not with reading, they are 'spoofing' search engines.

The conventional classical indexing has some advantages as well, such as maintaining :

- Quality through sifting and reviewing;
- Consistency by following controlled vocabulary;
- Standardisation by adopting internationally adopted formats;
- Reliability by adopting selection / filtering policy;
- High recall and precision ratios through agreed search strategies.

However, the major limitation of this indexing system is that it will be too costly to create and maintain manually for the large number of electronic documents currently available. Hence there is a need to produce better Internet-related processing tools. Indeed it is high time for the library and information science profession to respond immediately and positively to the situation and choose the BEST aspects of the two systems.

5. CONCLUSION AND SUGGESTIONS

Indexing and retrieval have always been at the core of classic information retrieval and they will remain so for the foreseeable future as well. While traditional indexing is not going to disappear, the professionals have to use the opportunities that come with Internet. To cite few expressions by professionals may not be out of place here. C.K.Ramaiah[25] opined "Call number added to a hyper media catalogue helps the user in locating the information and also the physical location of the books in different floors showing the pictures of those floors and stacks etc."

Chan[26] expressed "With computer capabilities particularly hypertext, the development of poly-hierarchical and multi-dimensional classification and post-coordinate indexing appear promising". Satija[27] opined, "Indeed with the use of IT, the method of doing has changed.... But in no way the technical services have been eliminated.... Tasks remain the same as mission remains the same—only tools have changed". Hence, "Due to the inabilities of computers to comprehend language or practice quality editorial control, the available capabilities of human-powered cataloging systems for now and in the foreseeble future remain essential tools for indexing the Internet."[28] Infact OCLCs Project Scorpion (1996) has attemted to assess the feasibility of using traditional cataloguing schemes such as USMARC and AACR2 to organise Internet resources[29].

Therefore, the need is to choose the best aspects of the conventional and Internet indexing techniques and devise methods that suit the library and net environment. Two factors that need this profession's attention are '*(i)* How can the subject retrieval tools found on the web be adopted for use in library catalogues? *(ii)* How can the traditional tools for subject retrieval in library catalogues, classification and subject indexing be used to control the great volume of information on the web?'[30] The following few suggestions, in addition to those already cited, may be of help to cope with the situation.

5.1 To Libraries

- The future of the LIS will depend on the ability of the profession to find solutions to provide value added services of quality filtering. Development of a filtering policy for Internet resources, to bring relevant information to users, will

definitely keep the profession in high esteem.

- In-depth book indexing can be applied to the online environment that can permit the user to select terms for formulation of search queries.
- The libraries can develop databases extracting relevant information from wider networks/Internet and build locally relevant databases following traditional indexing techniques. In other words, the library must continue to perform the organisation of universe of resources on Internet and make them most accessible to users physically and intellectually.
- The indexing methods may be improved through research and a set of indexers may be trained for the purpose.

5.2 To Web indexing

- A distinction should be made between general and subject information. There should be a control zone for subject access and open zone for general information.
- The field of Artificial Intelligence has to contribute much to overcome the present problems in Internet indexing.
- Topical clearinghouses that point to quality information have to be designed to meet the needs of serious readers on Internet.

S.R.Ranganathan stated in Prolegomena to Library Classification, "Classification will have to be done by human, until the computer can have the faculty of judgment built in it. Even then can the computer be made to do research in classification?" The same will apply for indexing today. Indexing would stay as an important tool even in the new information storage and retrieval facilities on the Internet. The relevance of indexing is eternal and the profession can never wither away with it. Indeed subject analysis activities have greater importance in Internet era than ever before.

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69

Concept Of Virtual Library

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ABSTRACT

This paper defines Virtual Library and traces its history. Discusses its various tools. Gives the hardware required for Virtual Library. It provides ways to access Virtual Libraries using Internet. Virtual Libraries are directories that contain collection of resources that Librarians or Cyberians have carefully chosen and organised in a logical way. Discusses its merits and demerits.

1. INTRODUCTION

Hybridisation is genes mutation (Interchange of genes) to get expected variant genetic variety in the species. Weaker unwanted genes are eliminated to substitute stronger species character to withstand climatic or habitual conditions and survive under adverse conditions. Struggle for existence and survival of the fittest is the law of nature. The revolutionary ideas of Charles Darwin, the father of evolution is relevant to a domain far remote from the Biological sphere *i.e.* the Libraries and Information centres. This idea was envisaged by Dr. S.R.Ranganathan in the fifth law of his five laws of Library Science, "Library is a growing organism". Change and adaptability are the hallmarks of nature. As organisms change slowly in their form, sise and structure, through evolution, Libraries are also changing by taking new material and changes in rate of growth to take up new form slowly and continuously. It has changed its character from Paper Based Libraries to Electronic Information Centres.

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This is an Electronic era or Information Technology (IT) age. IT is the convergence of various specialised technologies, like computer, telecommunication, optical digital systems, which are based on electronics. Therefore, Electronic Information Systems are now synonymous to information technology. Information technology has a great influence in all walks of life. Its application can be seen in education, research, Industry, Healthcare, Government etc. *i.e.* almost all the sectors. The developments in electronic information systems have also influenced libraries in a big way and helped the professionals to disseminate the information quickly, exhaustively and expeditiously out of the deluge of information. IT revolutions have converted information to power. Information is Power and Economic Information is Economic Power.

Inclusion of, Microforms like microfilms, microcards, microfiche, audiocassettes, video records, floppies, CD-ROMs has changed the very nature of Library system. It has changed the Library science to Library and information science. IT has profound influence in making Information Science into an Inter-disciplinary field. The functions carried out by the Library have changed considerably through the use of Communication Technology. Catalogues, printed indices and abstracts day by day have changed into videotext, fax, e-mail, optical disc, machine readable database, electronic journals and other media. There is much scope for revolutionary improvement in these.

Virtual, Library, E-Library, Cybrary, Digital Library are being established to slowly replace physical shelf oriented traditional Libraries.

These Libraries have collections in electronic form like CD-ROMs, online, Networking etc., which provide service over optical fibers. Modern libraries are group of interlinked services, which are connected to each other through high speed networks. Preservation, search and access, content creation and delivery are the essential components.

Virtual Library has offered the facility to enter the stored digitalised information and for interaction with media as well as manipulation of information. It has broken the barriers of conventional Library. Earlier the reader used to come to the Library, now the new form of Library will reach the reader with multi-

cultural assemblage. Electronic media makes available facilities for the effective use of sight and hearing.

2. DEFINITIONS

The demand for increased accessibility, more timely delivery of results and international coverage of business, technology and law has made Librarians look for more effective ways to serve customers. The current trend to meet the demand in many corporate houses is with virtual Library. Virtual Library universally implies electronic integration of new services with traditional library service. A virtual library may be as limited as an OPAC (Online Public Access Catal ue) or as comprehensive as using computer networks and electr ic resources for announcement of holdings and new developments along with delivery of reports, articles and books[1].

Virtual Library is but one of many terms that describes the activities that are underway. The virtual library is also called as desktop library, an Online Library, an electronic library or Information super highway. The common thread is use of technology to improve customer delivery as well the search and retrieval technology available on electronic networks.

A library with little or no physical collection of books, periodicals, reading space or support staff, but one that disseminates selective information directly to distributed library, usually electronically[2].

It is a traditional library that has transformed some significant portions of its information delivery channels into electronic format, so that many or most of its users do not need to visit the library to obtain information.

Such a library operates as a nexus of selected information management activities within the organisation. Some of the activities are centralised, but most of them happen through the efforts of decentralised staff, resources, systems. Even outside suppliers are accessible and dispersed throughout the organisation.

Virtual library is a library without walls, spread across the globe from where one is able to retrieve the whole world of information through a properly networked workstation. Here the user gets the impression as if he is moving through a large library

though library does not physically exist, yet the user is able to retrieve the information needed by him[3].

Usually virtual library, Electronic library, Digital library are used synonymously. But there subtle differences are between these.

Electronic library is a library that has wide spread use of computers and such other activities as online data bases and automated record keeping and computer based decision-making. The electronic media include both digital and analogue.

Digital libraries are libraries in which all information exists only in digital electronic format. The information itself may however reside on different storage media such as electronic memory magnetic or optical disks, but user will not necessarily perceive any difference between them.

Virtual libraries use the technologies of Virtual Reality (VR). This is known as telepresence in its simplest form. In a virtual environment, one would be able to browse without having to physically go to it.

Using Virtual Reality equipment and facilities one would be able to enter virtual library, browse around its rooms and shelves, use index or catalogue, select a book (by pointing to it and touching it).

3. VIRTUAL REALITY

VIRTUAL REALITY is an oxymoron, where Virtual means as existing or resulting in essence or effect though not in actual fact, form or name and Reality means the quality or state being actual or true. *i.e.* both these are self-contradictory words. The term Virtual Reality refers to an environment or object simulated by computer hardware and software in such a way that the viewer experience the environment or object as though it were real.

It is a form of human-machine (computer) interaction in which a real or imaginary environment is simulated and users interact with and manipulate that world. Users travel with in the simulated world by moving towards where they want to be and interact with things in the world by grasping and manipulating simulated object. In most successful virtual environments users feel that they are truly present in the simulated world and that their experience in the virtual world matches with what they would experience in the

environment being simulated.

In traditional computer generated graphics only one view of a scene is projected, rendered and drawn on the view display screen. But when a person views the real world, the left and right eyes see different views and the perceptual system uses these difference to judge the positions of objects in the scene. In traditional computer applications, user interaction modes are limited to trying on a keyboard, moving a mouse on a flat surface or perhaps using a handheld joystick. A primary goal of virtual reality is to develop strategies for creating a natural interaction environment that will contribute to a sense of presence in the simulated world.

Virtual Reality relies on a variety of specialised Input and output devices to achieve a sense of natural interaction in simulated environment.

3.1 Tracker

This is the most important of the input devices used in virtual environment. A tracker is capable of reporting its location in space and its orientation. Tracking devices may be optical, magnetic or acoustic. Optical system uses cameras to record user activity. In acoustic systems, the movable tracker element emits a high frequency sound, which is detected by a set of stationery microphones.

In magnetic tracking systems, the stationery element emits a pulsed magnetic field.

3.2 Data glove

It is an attempt to provide a truly natural input device. The data glove is out fitted with sensors that can read the angle of each of finger joints in the hand. Wearing such a glove, users can interact with virtual world through hand gestures, such as pointing or making a fist.

3.3 Stereoscopic Displays

The real world visual experience is approximated in virtual environment by using stereoscopic displays. Two views of the simulated world are generated, one for each eye and stereoscopic displays is used to show the correct view to each eye[4].

4. COMPONENTS

Virtual Library is a new concept of a user accessible network of computer-based information *i.e.* the computer based information are accessed through network. The basic components, which fulfil the concept of virtual libraries, are as follows:

4.1 Internet

The Internet is now with us and as a result fundamental changes in information work encompassing the Virtual Library and the 'Cybrarian' are being forecasted.

Internet is a self-organising network of networks. The Internet received its name from the fact that it connects a variety of computers with distinctive hardware and software. These computers are internet worked to allow them to communicate by translating messages into a mutually understandable language referred to as communication protocol. The protocol used by the Internet is called TCP/IP. The first true Internet was Arpanet, a military network established in the United States in the late sixties. It makes available resources such as e-mail, file transfer (FIP), remote login to hosts (Telnet), bulletin boards, gophers and WWW.

4.1.1 The World Wide Web (WWW)

In the year 1990 WWW was born. It is the result of a project initiated by Tim Berners-Lee, the father of the web, at CERN (The European Center for Particle Physics) in Geneva. This project defined the architecture of a retrieval system, for distributed information *i.e.* one that allows information stored in host computers or servers, to be accessed by client computers connected to the servers across a wide area network. Web is not only used to refer to the retrieval system but also to the body of information stored on the Internet that is available to users.

In common with other systems designed for network retrieval such as Gopher and WAIS (Wide Area Information Server) the web is implemented using server and client programs that run by each computer according to its status in the system. However there are at least three novel aspects of the Web's specification that distinguish it from systems with related aims.

4.1.1.1 Address Systems

It allow any information object (such as document, a menu options, a data file or an image) stored on any computer in the network to be given a reference that is both unique and independent of the network topology. Such a reference takes the form of string made up of a series of parameters and is known as Uniform Resource Identifier (URI) or Uniform Resource Locator (URL).

4.1.1.2 Network protocol

In common with Gopher and WAIS system, the Web defines its own protocol, HTTP. (Hyper Text Transfer Protocol). The protocol is a set of standard definitions that allows the communicating computers to recognise the type of objects with which they are dealing and the method by which they should be transferred. Despite its name, the objects transferred by HTTP may be of any type: text, hypertext, images etc.

4.1.1.3 Markup language

The logical mark up language is used to create documents in which the sources and the targets of Hypertext links are defined in a standard manner. The Hypertext Markup Language (HTML) is based on the Standard Generalised Mark up Language (SGML). Virtual libraries consists HTML pages densely filled with pointers to strange locations all around the globe[5]. Given the existence of support for the address system and network protocol, authors are thus enabled to create links between separate documents stored in different locations rather than merely within documents.

All Web clients are required to understand HTML in order to display hypertext documents from which users may navigate to other objects any where on the network (not necessarily HTML formatted themselves) by activating the embedded links[6]. An experimental stage is the use of Virtual Reality Modeling Language (VRML) which allows the creation 3-D environments.

With all these and other utilities Web is making it possible to bring primary information (as well as secondary information) directly to the users. It is equivalent to delivering the entire library, its catalogues, the holding and their authors to each user *i.e.* Virtual Library. Web has brought biggest change in how we obtain and view information.

4.2 Online Data Base

The term on line refers to the fact that the searcher is in direct communication on-line to the database he wishes to interrogate and to the computer on which the database is loaded. A search is conducted as a two-way conversation between the searcher and the system. Each takes turn to communicate with the other. So it is frequently refered to as interactive or conversational. The interaction between searcher systems is effected through some form of terminal connected to the computer through communication lines.

There are no real restrictions to this communication in terms of distance. A terminal may be in the same building as the computer facility or in the same complex of buildings or it may be several hundred or several thousand miles away. A terminal in the same building or building complex may be physically connected to the computer by cable where as remote terminals will communicate via telephone line or communication satellites[7].

5. SERVICES OF VIRTUAL LIBRARY

5.1 Online public catalogue

The growth of online library catalogues has been uneven in the beginning. Over the past decade, a number of online databases have become available for public use on the INTERNET. In 1992, there were over 100 OPACs and other accessible databases available on the two major listings on the INTERNET such as Art St George (University of New Mexico) and Ronald Larsen (University of Maryland).But now, the number of OPAC access sites including catalogues has increased to one million WWW[10]

5.2 Online search of bibliographic records

The Online searching of external database began in the mid 1960s. The first Online retrieval system was developed by the Systems Development Corporation (SDC). In the USA MEDLINE, prepared by the National Library of Medicine, began its operation from 1969 as one of the first bibliographic databases. There are several types of such databases like online directories, Library Catalogues, and full text databases now available all over the World.

Followings are some examples:

5.2.1 Abstracting and citation databases like PSYCINFO,machine readable counter part of Psychological Abstract. Similarly,SCISEARCH of Science Citation Index and Current Contents, the Publications of the Institutions for Scientific Information,USA.

5.2.2 Local, Metropolitan, Regional ,National and International Bibliographic Networks.

5.2.3 Databases of Union Catalogues *e.g.* National Union Catalogues of Scientific Serials in India.

5.2.4 Databases of Reference Sources like Ulrich's Periodical Directory.

5.2.5 Full text databases which provide the relevant information directly and give complete text of documents *e.g.* Harvard Business Review (HBR) offers both bibliographical and text details.

Full text newspapers and Journals are available online. There are at present 1700 electronic journals published on the Internet.

Many of the databases were first made accessible to the users by vendors-computer based agencies (like DIALOG, STN, Silver Platter, Palo Alto etc) that arrange access to various world Database for a fee, But now, the Online mode of service is increasing the world over through WWW[10].

5.3 Patents Information

Access to patent document is growing the world over, especially through the Web. This information on the Web is provided by the Government offices and private agencies. In India, the National Informatics Center has in its Patents database 28 million records from 1968 to 1997. It is available to the users on: http; // pk2id.delhi.nic.in

There are nearly 39 important patent websites offered by Government and about 10 private agencies on the net[11].

5.4. Grey Literature Including Reports of Workshops and Conference Proceeding

Online / Offline access to grey literature, has become possible lately and it is likely to grow as a specialised database on the

Web. *e.g.*

1. Library of Congress Cataloguing Newsline (LCCN): Online new letter of the cataloguing Directorate, Library of Congress. http: icweb.loc.gov/catdir/iccn/icc.html
2. European Library Automation Group [ELAG]. Progress reports of libraries under the European Commission **http:// www.ruca.ua.ac.be/ /10/**

5.5. SDI (Selective Dissemination of Information)

Virtual Libraries provide SDI service. A user may develop his SDI profile at an online terminal, store it in the system and visit the terminal periodically to discover what has been added to the data that matches his profile, since last he used the system. *e.g.* SDILINE a service provided by the National Library of Medicine, LISA.

6. VIRTUAL REALITY LIBRARY

Alan Poulter, for the first time introduced the term Virtual Reality Library, for a new form of online catalogue. He defined virtual reality library as "the bibliographic data from a typical Library collection being accessed via an interface which looks, on screen, like a roomful of shelves and which a user would navigate and control using a device like a 3D image"[8]. He further imagines that, the virtual reality library would be composed of images of shelves and items and background walls, floor and ceiling and all rectangular shapes.

So virtual reality library in essence is a computerisation of the physical structures, libraries used to order for the information resources they contain. According to him. Virtual Reality Library is in function a new form of OPAC (Online Public Access Catalogue) built using Virtual Reality technology.

The virtual reality library is Hypothetical. The following guidelines for users show the simplicity of virtual reality libraries:

(*i*) To use the system, enter through the door marked ' Entrance.' Now user is in the main room of the library.

(*ii*) Browse around the rooms in the library, following signs and verbal prompts to shelves that may contain items of interest.

(*iii*) Move close to shelf to see the items it contains single click on an item in a shelf to see all details for that item.

(*iv*) Single slick on an item detail if it is not interesting put it back on the shelf.

(*v*) Double click on an item details if it is interesting. It will be put back on the shelf and other shelves in all rooms containing copies of that item will be highlighted. Now these shelves can be browsed.

(*vi*) To leave the system, exist through the door marked ' Exit' in the main room of the library. If double clicked on any items, their details will be printed out for users.

The virtual reality library possess all the advantages that traditional shelf access had over typical online catalogues and none of the disadvantages. In fact it includes many of the functions of the online catalogue being translated into shelf browsing, like finding known sequence in the classified sequence.

7. MERITS OF VIRTUAL LIBRARY

Following are the merits of virtual library:

7.1 Ability to search

The ability to search provides an enormous potential for retrieval of information from resource available in electronic form. It relieves the user of many cumbersome jobs and helps the user to search or cull out the required information expeditiously and exhaustively. It thus enables the user to quickly and easily access the required information.

7.2 Ubiquity

Electronic databases or electronic copies of documents are ubiquitous *i.e.* an electronic copy of a document available in a library or a commercial organisation can be accessed from many locations by more than one users *i.e.* information in digital form can be accessed simultaneously by many users and at low cost. Thus, while a conventional library might only hold one or two copies of a book, a virtual library could generate an unlimited number of copies at the click of the mouse.

7.3 Requires less space

The storage of information in digital form would definitely reduce the space requirement. Huge volume of information can be stored only in a fraction of space in comparison to the printed version.

7.4 Access to nascent information

The users always seek for nascent information. The nascent information has a great value. There is no value for stale information.

8. DEMERITS

All is not rosy with the electronics or digital publication and with cyber or networked libraries. Colin Johnston, an online librarian brings out some of the problems. Following are the some of the reasons.

8.1 Not for comfortable reading :

Paper based publication provide far more comfortable reading when one has to read continuously and in comfortable postures, than any electronic or digital publication. As a result of this there is a fear of people losing the interest of reading.

8.2 Volatile Nature

The IT is dynamic continuum. There is always rapid changes in IT. For example CD-ROMs which are considered as interior technologist and are likely to be replace by DVDs in the near future, which means that the drives for CD-ROM will go out of market. The heavy investment made in CD-ROM collections will have to be repeated for acquiring the new technology based collection.

8.3 Internet publication has Two main problems

8.3.1 Lack of organisation of the information published through Internet. So one has to spend several hours even for exhaustive information search.

8.3.2 A large part of the information available on Internet is not evaluated or authenticated and therefore cannot be relied upon for serious use. Such a situation can sometimes lead to the possibility that Internet becomes a vehicle for disinformation, ranging from conscious deception to inadvertent inaccuracies.

8.4 Intellectual property right

IPR has become the barrier of development of virtual library. The digitised documents can be cop ed, transmitted and used very easily. This poses a major problem to enforce intellectual property right *i.e.* to safeguard the rights of the IPR owner. Laws are easily

violated in digital environment due to lack of control over content access and reproduction of multiple copies of digital media.

8.5 Prices of services are too high

The prices for electronic information services are incomprehensible. Since online services are introduced to the public more than twenty years ago this has always been the obstacle of the novice user who cannot see through the different layers of intermediating suppliers (database owners, producer, host, network, intermediary etc).

8.6 Deficiency in the information offered at three different levels

i. The information searched is not available (there is a misconception that all relevant information is available in electronic form).

ii. The information offered is not user-oriented (not every user is capable of understanding of some hard /core bibliographic references in MARC format)

iii. The information offered is not complete (full text/ original source are expected by many contemporary users.)

9. CONCLUSION

In spite of all these problems, it is certain that more and more electronic based information will be entering the libraries and its use will grow year after year. Ms. Natalia Grygierecsk, project manager of electronic library of the university of Utrecht, the Netherlands makes a voyage into 2050. She visualises. "Optical fiber cables and quantum leap processors constitute the structure of "Global Library", a repository comprising a colossal digital collection amounting to the volume of at at least 25,000,000 complete Britannicas. All such information is available at fingertips. Without having to browse through dreary catalogues without being afraid of missing crucial information because of an erroneous, code, not knowing the author's name. The disheartening 'out on loan' has become a thing of the past, a phrase in dictionary."[3]

The paradigm is shifting. Our world is increasingly built on information. So there is a pressure to adopt new technologies. The warnings are clear and loud, 'adopt or die'. Evolution is however a slow process especially for long established, reactionary, hierarchical organisations and professions.

Résistance to change cannot be under estimated and in the electronic arena there are always others waiting in the wings, keen to replace those who fall by the way side.

The virtual Library concept is the current trend in Libraries with the resources to provide this personalised service. It is the part of tradition of responding to customer needs for more valuable information, delivered more quickly and in more effective package. With the instant and infinite reach, virtual Library can now turn the concept of Global Village into reality. But whatever the changing panorama in the information sphere, the foundation of Library Science as enunciated by Dr. S.R. Ranganathan's five laws which will remain true and serviceable as ever.

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Need for Networking in Technical Institute Libraries

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ABSTRACT

The paper presents brief information about the need for networking of technical institute libraries in India. Resource sharing and networking in libraries are powerful tools for both increasing productivity and enhancing services to meet the changing needs of library users.

In the first phase, resource sharing project for the technical institute libraries of India is described. Networking of these libraries occur as a result of modern information technology which gives the opportunities for development of each participating library from traditional services. Possible paths for the establishment of networking are explored and potential linkages are identified. The significance of networking and resource sharing is highlighted.

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70

Re-orientation of LIS Education according to Contemporary Needs: Role of INSDOC

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ABSTRACT

The article describes the developments of LIS education in India. It explains the role of INSDOC in LIS education with special reference to the ever changing needs of Library/Information Science professionals.

1. INTRODUCTION

Library and Information Science education in India was started in 1911 when W.A Borden opened a library school in Baroda[1]. The first oneyear postgraduate course in library science was established at Madras University in 1937 owing to the efforts of Dr. S.R. Ranganathan. The course became a model for the development of library science training programmes in the country both before and after Independence[2]. Five university departments started library schools in pre-independence phase and also the library schools were restructured at graduate and post-graduate level. At present there are more than 107 universities, institutions, affiliated colleges and associations providing training programmes in LIS. These include distance education programmes offered by universities and the National Open School (NOS). and specialised courses offered by INSDOC, New Delhi and DRTC, Bangalore. Education in LIS is now well established and is pursued at undergraduate,

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graduate, post-graduate and docotoral levels. Since the quality of LIS professional reflects the quality of library /information services, high quality in LIS education is the need of the hour. In the accreditation of LIS course, the course contents, nomenclature of the course, teaching of information technology, internship, infrastructure, instruction techniques and system of examination play important role.

The rapid expansion of knowledge and development of research activities changed the traditional character of library science. LIS education is currently at a turning point. Various factors have contributed to a transition from conventional to automated library operations. Today computerised libraries alone can participate in networking at national and international levels. It is the only way by which efficient, standardised and better services can be assured.

Computerised libraries need professionals trained in computer and information technology. In the context of on-going developments in information technology and its diverse applications, the library and information professionals must develop new skills. The libraries will have to manage the flow of information particularly in the scholarly communication and electronic publishing, while protecting the intellectual property and preserving the priceless collection.

To train highly skilled library professionals in information technology a qualitative improvement in LIS education certainly is required.

A course curriculum indicates the dimension of the teaching-learning process. Curriculum development is a very important process. Computers process the information and telecommunications disseminate it. Computer technology is therefore needed in library automation and telecommunications technology in the construction of information network, Internet service, electronic resources, databases, WWW, e-mail and online services. The present scenario compells library professionals to shift away from the traditional form of library practices. The present system requires library personnels of high caliber and in sufficient number so as to plan, manage and operate a wide range of libraries, information centres and services.

2. OBJECTIVE OF LIS COURSES

The main objective of LIS course can be stated as below:

(i) To provide the students an understanding of the basic principles and fundementals of LIS;

(ii) An understanding of the vital role of information as an essential input in all developmental activities;

(iii) A thorough insight into all techniques of information handling with special emphasis on the application of information technology;

(*iv*) Full comprehension of the global nature of information for proper cooperation and co-ordination among countries;

(*v*) Necessary skills in information technology for designing, implementing operating and managing information system;

(*vi*) To enable the student to understand and appreciate the function and purpose of library in the changing social and academic environment;

(*vii*) To train the students in the techniques of librarianship and management of library;

(*viii*)To familiarise the students with basics and methodology of planning, designing and developing the information system and with the service at local, national, regional and global levels; and

(*ix*) To familiarise the students with the application of modern management ideas and techniques in the management of information system and services;

3. EXISTING LIS EDUCATION IN INDIA AND ITS DEFICIENCIES

(*i*) There is no uniformity in the duration of courses at the certificate level;

(*ii*) Deficiencies exist in teaching methodology, mode of instruction, course control and research programmes;

(*iii*) No central accreditating body for both under-graduate and post-graduate courses in India;

(*iv*) No information technology based training schools for LIS teachers in the country;

(*v*) No standardisation of LIS education in distance mode in

the country as well as regular LIS course;

(*vi*) Growing need of IT trained professionals in LIS course;

(*vii*) Most of the Indian LIS schools lack adequate infrastructure facilities.

4. ROLE OF GOVERNMENT, UGC AND OTHER PROFESSIONAL BODIES

The role of Government in quality assurance in LIS education in India is not quite satisfactory. Government. has not succeeded in generating more job opportunities for library professionals. It should play leading role to promote LIS education in India and act as central accreditating body for LIS education like the USA does it through National Commission on Library and Information Science (NCLIS). It should empower the UGC to create a central accredidating body. The professional bodies like ILA and IATLIS are organising seminars/conferences and promoting the status of the library professionals in the country but they have certain limitations to the accereditation of the LIS course. Library professionals must put pressure on Government to form national council on Libirary and Information Science under Union HRD Ministry on urgent basis. Government should generate more job opportunities for LIS professionals and the disparity in pay scales should be removed among LIS professionals. The formation of Curriculum Development Committee (CDC) in LIS was a good step towards maintaining quality in LIS education in India[3]. LIS schools should be founded on the guidelines of the UGC review committee report[4].

5. INSDOC'S HRD PROGRAMMES

Indian National Scientific Documentation Centre (INSDOC) is a premier institution in information science, information technology, information services and systems in India. It is a national laboratory set up by an act of the Parliament in 1952 under the Council of Scientific and Industrial Research (CSIR), Government of India for providing information and documentation services both at the national and international level.

Contemporary areas of activities of INSDOC include library

automation, CD-ROM networking, electronic libraries, database design, multimedia information management, abstracting and indexing, library management, wide area networking, online information systems, informetrics, education and training in information science and technology and electronic publishing. Infrastructural facilities at INSDOC include a large number of computers and communication systems supporting multimedia computing environment, global electronic mail and internet access. Wider dissemination of Scientific and technical information is an important aim of INSDOC. To fulfil this, it has a network of regional laboratories located at Bangalore (RCB), Kolkata (RCC) and Chennai (RCM).

Equipped with necessary manpower and facilities, INSDOC, has been organising HRD programmes since 1964. These programmes can be broadly categorised as follows:

(*i*) Associateship in Information Science (AIS);

(*ii*) Short Term Training Courses;

(*iii*)Attachment Training Programmes;

(*iv*) On-site Training programmes; and

(*v*) Staff Training Programmes

5.1 Associateship in Information Science

INSDOC has been offering an advanced training course in documentation and reprography since August 1964. The course has been undergoing revision from time to time to meet the changing manpower needs and to incorporate the expanding dimensions of the subject of documentation and information science.

The course in documentation and reprography (1964-66) had four terms of three months each.

First Term (three months) was devoted to general orientation course in library science covering all conventional disciplines of classification, cataloguing, reference service, bibliography, organisation and administration.

Second Term (three months) was concerned with the pattern of knowledge and the continuation of the study of classification, cataloguing and indexing.

Third Term (three months) dealt with the concept and evaluation of documentation and its organisation at all levels It also dealt with organisation of translation. documentation and reprographic services.

Fourth term dealt with the techniques of reprography and modern methods of information storage and retrieval. Every student was assigned a project at the beginning of the second term which ran through the remaining terms .

The following eight papers were taught:

(*i*) Library Science I:

(*ii*) Library Science II;

(*iii*) Pattern of knowledge and classification;

(*iv*) Cataloguing and Indexing;

(*v*) Documentation I;

(*vi*) Documentation II;

(*vii*) Information storage and retrieval; and

(*viii*) Reprographic methods

The course was modified as follows in 1966-67:

(*i*) Organisation and Administration of special libraries:

(*ii*) Refernec service and bibliography;

(*iii*) Pattern of knowledge and classification;

(*iv*) Cataloguing

(*v*) Documentation: organisation;

(*vi*) Documentation techniques;

(*vii*) Modern methods of information storage and retrieval; and

(*viii*) . Reprographic methods

The course was further modified in the following way in 1969-1970

The course was conducted in two terms each of six months duration. The first term was devoted to the study of library and documentation services, covering all the conventional disciplines of classification, cataloguing, reference services, literature search and bibliography. The second term dealt with the processes of

scientific and technical communication, information handling and dissemination, including machine methods of information storage and retrieval and the techniques of reprography.

Every student was assigned a project at the middle of the first term which ran through the remaining terms. The successful completion of the project was essential for success in the examination.

The eight theory papers were revised as follows:

(*i*) Special Library Management;

(*ii*) Organisation of Documentation Services;

(*iii*) Classification;

(*iv*) Cataloguing;

(*v*) Scientific and Technical Communication;

(*vi*) Indexing and Abstracting;

(*vii*) Modern Methods of Information Handling; and

(*viii*) Reprographic Methods

Practical Papers:

(*i*) Library operations, Reference service, Bibliography and Literature search:

(*ii*) Classification and Cataloguing:

(*iii*) Indexing and Abstracting: and

(*iv*) Information Handling and Reprographic Methods

The Course has been revised in 1974-75 as follows:

The course extended over a period of twelve months devoted to the study of information and communication, information system at national and international level, including management and functional operations of the elements of the system, classifications and indexing as technique for the intellectual organisation and information, computerised information system, reprographic methods, industrial information and technical writing, along with the theoretical study, exercises set in each area gave the trainees knowledge of practical application. Each candidate had been assigned a project in the middle of the year, a report on which was to be submitted

four months after formal period of training is completed. Another important feature of the course was the periodical holding of colloquia, which provide the trainee opportunities for articulation, collective thinking and debating.

Eight theory and corresponding practical papers were revised as given below :

(*i*) Information and Communication;

(*ii*) Information Systems;

(*iii*) Classification and Indexing;

(*iv*) Dissemination of Information;

(*v*) Computerised Information Systems;

(*vi*) Information for Industry;

(*vii*) Technical Writing; and

(*viii*) Reprographic Methods

The course was thoroughly redesigned in 1977 and renamed as "Associateship in Information Science (AIS)". The course offered comprehensive instructions in all the aspects of Information Science with particular emphasis on the practical side.

The course of study consistsed of the following seven areas:

Area I Foundation

Paper 1: Information, Communication and Society

Paper 2: Technical Writing

Area II Information Resources and Materials, Systems and Programmes

Paper 3: Information Sources and Media

Paper 4: Information Systems and Programmes

Area III Method of Information Handling

Paper 5: Information Processing and Organisation

Paper 6: Information Services

Paper 7: Information Technology and System Design

Area IV Planning and Management

Paper 8: Information System/Centre Management

Area V Elective paper

Elective Paper has been introduced for the first time

Paper 9: (One elective subject from the following)

- Information system for planning
- Information system for Industry
- Bio-medical Information System
- Energy Information System
- Environmental Science Information System

Area VI: Guided Research

Paper 10: Project work and dissertation.

Area VII: Supporting subjects (appropriate and relevant selections from other disciplines helpful in the better understanding of Information Science such as Research methodology, statistical methods, Operational Research and System Analysis, Informational Linguistics etc.)

Field Work

Opportunites were provided for students to visit, observe and study the working of institutions such as documentation and information centres, libraries, Govrenment departments connected with industrial development, planning, etc..

In 1984-85 the course was modified as mentioned below:

Paper 1 Information, Communication and Society

Paper 2 Technical Writing and Information Analysis

Paper 3 Information Sources and Media

Paper 4 Information Processing and Organisation

Paper 5 Information System and Services

Paper 6 Information Technology I: Concepts, Theories, Systems

Paper 7 Information Technology II: Applications

Paper 8: Information System/Centre Management

Paper 9: Elective subject (project)

One elective subject from the following was to be selected: Information System for Planning; Information System for Industry; Bio-medical Information System; Energy Information

System; Environment Science Information System

Paper 10: Dissertation

Colloquia and seminars were held to improve articulation, collective thinking and debating abilities. Besides the students also were provided opportunities to participate in seminar, workshops and other short term courses conducted by INSDOC from time to time..

Guided Research

Project work and the preparation of a dissertation on an assigned topic constituted a major part of the course. This work was carried out in the second year of the course and dissertation was to be submitted at the end of the second year of the course.

A slight modification of the course took place in 1990-91as given below:

Paper1	Information, Theoretical Aspects
Paper 2	Technical Writing: Information Analysis and Repackaging
Paper3	Information Sources and Media
Paper 4	Information Processing and Organisation
Paper 5	Information Services and System
Paper 6	Information Technology I: Computer Science & Technology
Paper 7	Information Technology II: Telecommunication, Technolo gies, Recording and Display, Technologies and Applications of Information Technologies
Paper 8	Information System Management
Paper 9	Project in any one of the following areas: Planning, Management, Industry, Education, Rural Development, Environment, Energy, Natural Resources, Biomedicine, Biotechnology, Agriculture etc.
Paper 10	Dissertation

The course has been divided into two semesters in 1994-95 as mentioned below:

Semester I

Paper 1 Information: Theoretical Aspects

Paper 2 Information Sources

Paper 3 Information Processing and Organisation - Part I

Paper 4 Information Systems and Networks

Paper 5 Information Technology Part I: Computer Science and Technology

Semester II

Paper 6: Information Products and Services

Paper 7: Information Processing and Organisation -Part II

Paper 8: Information Technology - Part II

Paper 9: Information System Management

Paper 10 Elective (Any one of the following):

Informetrics; Technical Writing; Information Users: Needs, Surveys and Education and Research Methodology

Paper 11 Dissertation

Colloquia and Seminars

Field Work

In 1995 the paper 8 has been renamed as Information Technology - Part II Networks

In 1996 more Elective Papers were introduced as under:

Informetrics; Technical Writing; Information users; Needs, Surveys and Education; Research Methodology; Business Information System; Geological Information System; Medical Information System; Patents Information System and Principle and Concepts of Technical Translation.

In 1998 further revision of the course has taken place as mentioned below:

Semester I

Paper 1 Information and Society

Paper 2 Information Sources

Paper 3 Information Processing and Organization

Paper 4 Information Systems & Library Automation

Paper 5 Fundamentals of Information Technology

Semester II

Paper 6 Information Products and Services

Paper 7 Data Processing and Management Techniques

Paper 8 Computer Networking: Technology and Services

Paper 9 Information System Management

Paper 10 Elective (Any one of the following)

Informetrics; Technical Writing; Research Methodology; Business Information System; Geological Information System; Medical Information System and Patent Information System

Paper 11 Dissertation

Colloquia and Seminar

Field Work

In 2001 - 2003 Paper 4 has been changed as Information System & Networks

5.2 Short-Term Training Courses

Short Term Courses are being organised at INSDOC since mid-1980s to upgrade mainly IT based information handling skills of LIS professionals. These courses are presently being conducted both at INSDOC, New Delhi and its Regional Centre at Chennai (RCM). Around 25 courses are conducted each year on the following topics:

Barcode Technology (3 days); Bibliometrics (1 week); Computer Applications to Library and Information activities (5 weeks); E-commerce Fundamentals (2 weeks); Electronic Publishing(1 week); internet for Librarians (3 days); Internet & Web design (1 week); Internet Access and Online Information Retrieval (1 week); Library automation and resource Sharing (1 week); Technical Writing (2 weeks); Visual Foxpro and MS-Access (2 weeks);Windows, MS-Office and Internet (7 days) and WINISIS (2 weeks)

The intake for each course is 20 and accommodation is provided on request at extra cost. Depending on demand, every year new courses are being added.

In the year 2001-2002 the following new courses have been added:

Technical Writing; Internet for librarians; Internet and Web design and E-Commerce Fundamentals.

5.3 Attachment Training Programmes

INSDOC organises regularly on-the-job training or Attachment Training Programmes for persons requiring specialised training in the field of information science, information management, information technology and related activities. In such programmes, the training components and schedules are customised to suit the requirements of an individual taking into account his/her professional background, work experience, etc. The individual is given on-the-job training in addition to formal lecture sessions.

Apart from various orgainisation from India, several international organisation like International Federation of library Associations and Institutions (IFLA), World Health Organisation (WHO),National Institute of Education (Sri Lanka), National Centre for Scientific and Technological Information and Documentation (Vietnam) and SAARC Documentation Centre (SDC) sponsor candidates for these programmes. The duration of training varies from one week to six months depending on the need and the topics covered.

5.4 On-Site Training Programmes

INSDOC organises on request Short Term Courses in Information handling at the customer's premises subject to a minimum of 10 participants. One such course on Technical Writing was organised for the staff of M/s Hughes Software Limited at their premises at Gurgaon during August 30- September 07, 2001.

5.5 Staff Training Programmes

INSDOC deputes its staff members to training programmes/ conferences/seminars in order to keep them abreast of the latest developments in the fields of information science and technology, computers and communication.

The information regarding the forthcoming conferences/ workshops/seminars, etc. in the field of information science and technology is collected and suitable staff members are identified for these events.

A conference/training database containing all the details

about conferences/training programmes attended by staff members of INSDOC since 1989-90 is being maintained. The database helps in providing information about the conferences/training programmes attended by the staff members and serves as a key element for identifying appropriate members for deputing to subsequent events.

6. CONCLUSION

LIS education has come a long way in India and it has picked up with the introduction of courses in distance education mode and the availability of short term, attachment and on-site training programmes at some universities and institutions. Apart from this, some professional associations are also conducting both long term and short term courses. UGC Refresher courses and Summer Schools are being conducted by some universities and institutions. In this regard INSDOC has been playing leading role since 1964 not only by conducting various HRD programmes, which are restructured from time to time to suit the needs of LIS professionals, but also by providing scholorships, internship and placement services. Other institutes may follow suit to improve the quality of LIS education.

7. ACKNOWLEDGEMENT

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71

Library Services and Distance Education in Jammu and Kashmir State

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ABSTRACT

Libraries are very important component of any education system. In distance education system, where the students and teachers are away from each other, the role of libraries becomes important. The paper discusses the growing information needs of distance learners and the present scenario of library services available to distance learners. The extent to which the libraries in the Jammu and Kashmir state are being used by distance learners, the problems faced by distance learners to avail the library facilities and problems of libraries in providing effective library services to distance learners are also dealt with. Suggestions have been made to introduce the new technology to enhance the quality of library services to distance learners.

1. INTRODUCTION

The history of distance education started from the middle of 19th century. The early forms of this innovative system of teaching and learning were the instructive letters in the Old Testament and some other works in early Greek Roman history. It is believed that the modern history of correspondence instruction began in 1840 with Issac Pitman's short hand course for distance students through post. Some researchers say that distance education started in 1833 when a private teacher of English taught composition by post. In 1856, a school of modern languages was established by Langen Scheidt and Tdlessaint to teach foreign languages by post. In USA, the first efforts to organise correspondence courses were

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made in 1873. By 1890, some Universities in USA started correspondence courses. In Europe, Germany and Sweden took the lead. With the onset of twentieth century, a number of correspondence instruction schools were set up throughout Europe. In Russia, correspondence study became the main form of university level studies and by 1962 more students studied through correspondence courses than through the regular class room instruction in colleges and universities. In Japan, over a million students are studying through correspondence courses. In Australia and New Zealand, correspondence instruction is being used in the compulsory school system to teach children who had never been to a classroom. In England, distance education has made another landmark with the establishment of the first open university of the world. It was the setting of this university, which made distance education a concept different from correspondence education.

Varied names such as home study, postal tuition, independent study, correspondence course, etc. were given to the earlier forms of distance education programmes through out the world. Even now, terms like off-campus studies, external studies, non-formal education etc. continue to be in use. The International Council for Correspondence Education (ICCE) at its 12th World Conference held in 1982 in Vancouver, under the presidentship of Prof. Bakshish Singh, renamed itself as International Council for Distance Education (ICDE).

2. OBJECTIVES OF DISTANCE EDUCATION

(*i*) To provide educational facilities to those who could not benefit from the formal system of education.

(*ii*) To help socio-economically backward students to receive education.

(*iii*) To make the educational institution going to the students rather than the students coming to the university.

(*iv*) To provide opportunities to the educated citisens to study further while remaining at the places of their work.

(*v*) To provide less expensive education.

(*vi*) To solve the problem of increasing pressure on formal education.

(*vii*) To assist elderly people, housewives and government employees.

3. DISTANCE EDUCATION IN INDIA

A beginning in distance education in India was made with the appointment of a committee under the chairmanship of Prof. D.S. Kothari (1961) and the introduction of correspondence courses in Delhi University (1962).

In 1982, for the first time in the history of distance education in India, the Government of Andhra Pradesh established Andhra Pradesh Open University, Subsequently the Government of India in September 1985 decided to set up the Indira Gandhi National Open University at Delhi.

The Distance Education system has seen significant growth. We have today one National Open University, ten State Open Universities and nearly sixty-two Directorates of Distance Education/Correspondence Institutes.

4. INSTITUTION OF DISTANCE EDUCATION AND THEIR LIBRARIES IN JAMMU AND KASHMIR

4.1 Directorate of Distance Education, Jammu University

The Directorate of Distance Education at Jammu University was established in 1976. Initially it was known as the Institute of Correspondence Education with the desire to provide education at the doorsteps of the learners. During the period 2000-2001, 6449 students were registered for various courses in the Directorate. At present fifteen teachers and four officers are working in the Directorate along with fortynine non-teaching employees. The Directorate has a library, which has a collection of 20,000 books on various subjects introduced for distance education. It has opened one library-cum-study centre at Degree College, Kathua in Jammu and Kashmir and intends to open library-cum-study centres in all other District Head Quarters of Jammu region in the near future.

Courses Introduced in DDE, Jammu University:

(*i*) B.A/B.Com.

(*ii*) B.Ed.

(*iii*) M.Ed.

(*iv*) M.Com.

(*v*) M.A. Economics

(*vi*) Post Graduate Diploma in Business Management

(*vii*) LL.B. (Acad)

(*viii*) Certificate Courses in Urdu through Hindi Medium

(ix) English improvement course.

NEW COURSES

The Directorate of Distance Education has initiated measures to launch one year Post Graduate Diploma course in Computer Applications from the Academic year 2001-2002.

4.1.1. DDE Library, Jammu

The library of the Directorate started functioning in 1976. In the first year of its starting, the library had a collection of 425 books. Library has at present 20000 books on the subjects for study offered by the Directorate. Every year about 800 books are added to the library. The library is subscribing to a large number of newspapers, periodicals/magsines for the readers of the library. The library is not having sufficient space. Only, about 20 readers can study in the library. One hundred students consult the library daily and the same number of books are issued and returned. The library is providing audio-video services to the students of the Directorate and it has a large collection of cassettes in the library. The library is providing reference service also. Two books are issued to the students for one week against the deposit of Rs. 200 as library security. The Directorate has opened one library-cum - study centre at district Kathua and plans to open library-cum-study centres at other districts in the Jammu region in the near future.

The library has one Assistant Librarian and one Professional Assistant with one library bearer to assist them. The Library Committee made budgetary provision of about Rs. 7,00,000 for purchase of books in the year 2000-2001 for the Directorate library and of Rs. 80,000 for the library of the Study Centre in Kathua district, The Study Centre Library has about 500 books in its collection.

4.2. Distance Education Department, Kashmir University

The Department of Distance Education at Kashmir University was established in February 1976 as the Centre for Correspondence Courses. In 1985, it was renamed as the Department of Distance Education. The Faculty of Non-formal education comprises the Department of Distance Education, Directorate of Adult and continuing Education and State Resource centre as its constituents.

At present Distance Education Department of the University has one Assistant Registrar and 9 teachers to look after the work of the department. About 10,000 students were registered in the year 2001-2002. The department has established many study centres in Kashmir division *i.e.*, Srinagar, Pulwama, Anantnag and Sopore; one study centre at Jammu and two at Leh and Kargil with the cooperation of DIETS and Govt. Degree Colleges. These centres are voluntarily being managed, without any infrastructural facilities. These study centres provide the students with support services in the form of contact-cum-counselling services, library services, summer schools etc.

Courses Introduced in DDE, Kashmir University

(*i*) M.A. Urdu, M.A. Economics, M.A., Commerce, M.A. Mathematics.

(*ii*) M.Ed.

(*iii*) B.Ed.

(*iv*) LL.B. (Acad)

(*v*) Certificate course in Library Science

(*vi*) B.A./B.Com. degrees

Future Programme

The department in near future is going to launch the following courses:

(*i*) Diploma in computer application.

(*ii*) Diploma courses in primary education.

(*iii*) Certificate course in Pre Primary Teacher Training

(iv) Certificate Course in Creative Writing in Urdu.

(*v*) Bachelor degree in Library and Information Science.

(*vi*) Course in Gender and Health.

4.2.1. DDE Library, Srinagar

The DDE Library was established in 1976 along with the Directorate. It has a collection of 5000 books and is subscribing to a large number of Journals and Newspapers. It is catering to the needs of 10000 students enrolled in the Directorate. At present, library has one Professional Asstt. and One library bearer to look after the library work.

4.3. IGNOU Regional Centre, Jammu

The IGNOU Regional Centre, Jammu started functioning in April 1998. It has established Library-cum-Study Centres in all districts of Jammu region. The Regional Centre has computer, photocopying, Internet, e-mail and fax facility also.

Staff

Regional Director	1
Assistant Regional Director	3
Asstt. Registrar	1

Students Registered

Year	No. of Students
1998-99	1200
1999-2000	4000
2000-2001	4500

4.3.1. IGNOU Regional Centre Library, Jammu

The Library has about one thousand reference books for consultation by the students. Library keeps one copy of self-learning material of each course, which students consult there. It has audio-visual facility also. One Professional Assistant is looking after the work of Library, it remains open from 9am to 6pm. A large number of students consult the Library daily during the library working hours.

4.4. IGNOU Regional Centre, Srinagar

The Centre started functioning in July 1998. In the beginning it was a Nodal Centre, functioning under Jammu Regional Centre of IGNOU. In 1999, it became a fulfledged Regional Centre and started functioning independently. It has established its library cum study centres in almost all districts of Srinagar. The Centre has computer, Internet, e-mail, fax and photocopying facility also.

Staff Officers

Regional Director	1
Asstt. Regional Director	2

Students

Year	No. of Students
2000-2001	3640
2001-2002	8331

4.4.1. IGNOU Regional Centre Library, Srinagar

The IGNOU Regional Centre Library at Srinagar also started functioning in 1998. The Library contains self learning materials of all courses introduced in the centre. It has about 300 books. One Professional Assistant is looking after the work of the library. It has a audio-visual facility also. Library remains open from 9 am to 6 pm. A Large number of students use the library during the library hours.

5. IMPORTANCE OF LIBRARIES

A library acquires a central place in a university; it caters to the academic and research needs of the students and faculty and facilitates independent learning. It works like a backbone for generation of new knowledge. A distinguished Vice-Chancellor of a modern university in England, Sir Charles Grant Robertson, once said, "If I were a dictator, I would reduce the time devoted to lectures to a third of that usually occupied by them and insist on the students spending three hours every day in the Library". Similarly, various commissions set up on higher education in India have attributed great value to the University libraries. Kothari Commission in its report had emphasised the importance of libraries in higher education. It asserts, "No University/College or department should be set up without taking in to account its library needs in terms of staff, books, journals, space etc. Nothing could be more damaging to a growing department than to neglect its library or to give it a low priority. On the contrary, the library should be an important centre of attraction of the college or university campus". The National policy on education has further reiterated the need for better library service.

Generations after generations of computer hardware and software emerged during the last fifty years. But most of the

libraries in India are not yet computerised. Libraries are also responsible for this sorry state of affairs. They have not yet popularised the library services and made the academic community aware of the important role that libraries can play in the changing environment. Even today, they insist on continuation of the traditional system for delivery of information, where as the libraries are the most dynamic institutions like the disciplines of technology and medicine. They can play the role of catalyst for promotion of research, since the knowledge first knocks at their doors and is later diverted to the area of the actual need. So far, they have remained confined to books and the other forms of printed material. Many technologies emerged and vanished in the meanwhile, but no visible impact could be seen on the university libraries. Similar is the case of computer application.

Our university libraries are not able to deliver goods with their vast resources, where as the conventional resources alone cannot deliever good service. The libraries of western countries have been so resourcefull that even to satisfy our indigenous needs, we generally consult their collections. Though we have enough resources in India, they are not shared jucidiously for innovation and development.

6. DIFFICULTIES FACED BY DISTANCE LEARNERS

The distance learners have high expectations from the libraries at the study centres. Their needs are many and varied. The self-instructional materials provided by the university are not self contained. Students need to depend on additional text books, reference books and journals beyond their course material for writing their assignments, projects and preparing for the examinations. Problems faced by distance learners in utilising library facilities are discussed as under:

- Study centres are open only on weekends and holidays; thus the students cannot refer to the books at their convenience.
- Collection of books at study centres is not sufficient to meet the demands of the students pursuing post-graduate courses.
- The study centres are not always approachable for the students residing in remote areas.
- Question paper of previous years are not available at the study centres.

- Photocopy facility is not provided to students in most of the centres.
- Insufficient space and staff and paucity of funds in library are causing great difficulty to distance learners. The space provided for the library is not sufficient, because of which the books are not organised properly.
- Staff appointed at study centres are temporary. They are not professional librarians and are unable to provide the library services effectively in most of the cases.
- Budget granted to libraries is not sufficient to meet their needs.
- The library-cum-study centres have not been opened in all district headquarters. Therefore the students face great difficulty in consulting the study material.
- Study material sometimes does not reach in time because of postal and transportation problems.
- The study material is not updated regularly and skilled professionals are not associated sometimes in preparing the material.
- Lack of accommodation facility for distance learners in the Directorates during the personal contact programme affects many of them.
- Non-issuance of books to the distance learners living in remote areas, is another problem as the books are issued to the students only for one week.
- Non-availability of Internet, e-mail and computer facility in the libraries of the Directorate/Institutes.
- Lack of sufficient space in libraries.

7. SUGGESTIONS AND RECOMMENDATIONS

Some suggestions and recommendations are made here to make the distance education system more effective :

- More libraries should be opened in all the states. These libraries should allow distance learners to use their resources by paying nominal fees.
- To reach the remote areas, provision of mobile libraries should be introduced.
- Postal library service may be introduced, so that students

living in remote areas are able to borrow the books.

- Large number of books may be purchased for study centre libraries.
- Sufficient budgetary provision should be made for study centre libraries.
- Professional and qualified library personnel should be appointed at study centre libraries for providing effective service to distance learners.
- A provision should be made to subscribe journals for study centre libraries.
- Current awareness services should be provided to distance learners, so that students may come to know about new additions in libraries.
- Automation of library operations as well as net working of study centre libraries with headquarter library is also important.
- E-mail facility should also be provided to study centres, so that the communication about the required documents is easily possible.
- Catalogue of the main library should be put on Internet, so that students can have access to the catalogue from their centres.
- Library-cum-study centres may be opened at all district headquarters.
- Provision may be made for issuing books to distance learners living in remote areas against a security deposit for 15 days.
- Comptuterisation of libraries, along with Internet, e-mail and photocopying facility is must for distance learners.
- Study hours may be extended at library-cum-study centres.
- New books should be added to the collections regularly.
- Accommodation facility may also be provided to the distance learners during the Personal Contact Programmes near the library of the Directorates/Institutes of Distance education.

8. CONCLUSION

Provision for sufficient annual budget may be made for adding latest books in the collections of the library along with computer,

internet, e-mail and photocopying facility to the distance learners, so that the latest information can reach them and they can also get the benefits of revolution brought about by the information Technology. Moreover, network of local libraries should be established which can help in bringing knowledge to the doorsteps of the needy learners. It will provide an efficient library service to distance learners.

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72

Skills Required by LIS Professionals in the New Millenium

SANGITA GUPTA *

ABSTRACT

Information technology has affected almost every facet of library activities. Libraries are facing new challenges, new competitors, new demands and information queries from the users. Keeping in view the technological changes, library professionals have to adapt to the changing environment. Apart from the technology skill and knowledge they are supposed to be deft in professional skills and managerial skills. The present paper highlights the importance of the skills required at various levels by LIS professionals.

1. REORGANISATION OF LIBRARIES

Gone are the days when libraries would be considered the storehouses of books and literature meant for dissemination of knowledge. Tremendous growth in literature and information has led to knowledge explosion. This in turn led to complications in information generation, handling and use. With the emergence of computer and communication technology the generation, handling and communication of information has become easier and faster. Libraries and information centres hardly function without computers. Almost every facet of library activities has been affected. Rapid advances in information technologies are replacing the traditional techniques of acquisition, retrieval, collection and storage of documents. Developments in information technology play a vital role in reorganisation of libraries

In the new millennium, we see the paradigm shift from:-

- Print-based publications to electronic documents.

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- Stand-alone libraries to networks.
- Monopoly to competitive environment.
- Passive user to active user.
- Authority based decision to user-based decision
- Institutionalisation to deinstitutionalisation

Libraries are facing new challenges, new competitors, new demands, new expectations and information queries from the users. Efforts are being made to exploit technology for maximising information storage and dissemination procedure so that information requirements of the users may be fulfilled. Information Technology has its impact on the manipulation of library records and has resulted in the formation of automated systems, data management, computerised catalogues, information retrieval packages, on-line systems and networks. Library professionals are required to deal with all aspects of information technology concerning the management of data and information. A survey[1] of five university libraries conducted by the author reveals that a large majority of university libraries are still in the first stage of computerisation. They are just converting their retrospective library records into machine-readable form. They have yet to computerise their services. The main reason behind this lack of computerisation in libraries is the negative attitude of professionals and the absence of skilled manpower in IT applications to libraries. Keeping in view the technological changes, library professionals will have to adapt to the changing environment. Human factor is the most significant aspect of our technological system[2]. Japan is the eye-opener. It has made outstanding achievements due to technological development through manpower.

2. SKILL REQUIREMENTS FOR LIBRARY PROFESSIONALS

Having entered electronic environment of the 21st century, the expectations from upcoming library and information professionals are quite high and complex. Traditional LIS professionals used to administer library catalogue and provide public library services to users. With electronic handling of information the situation has changed. They are now expected to have requisite level of knowledge and skill. LIS professionals have to develop new skills and strategies to survive and continue to compete in the electronic

environment.

(*i*) LIS professionals should be expert in information content development (ICD). ICD requires skills in data organisation, structuring and presentation of content in a helpful format so that the users may retrieve information easily. ICD industries[3] have been recommended many times for the optimal exploitation of IT developments.

(*ii*) Another skill required for LIS professionals is the knowledge of information consolidation techniques. They must be versed with the technique of indexing. They should be involved more in the process of tailoring and repackaging of information. They must have the knowledge to customise information accessed by technology. They require the skill to analyse, synthesise, evaluate, and interpret, to reformulated the information. They need to acquire skills to filter and organise information largely in the electronic form.

(*iii*) LIS professionals must have analytical ability *i.e.* to assess the information requirements and expectations of clients with reference to weakness and strength of sources and services available in libraries and information centres.

(*iv*) Digital world demands computer literacy and information literacy. LIS professionals must have the following IT related skills :

- Keyboard familiarity
- Operating system
- Library Application Programs like CDS/ISIS, LIBSYS, etc.
- Handling of IT products
- DTP
- Word-processing
- Generation of reports
- Information retrieval skill like online searching,
- Searching CD-ROM databases
- Internet surfing and skills required for accessing internet

(*v*) LIS professionals must acquire detailed knowledge of at least one body of sources. They must have understanding of how

published information is created, priced and incorporated into business research.

(*vi*) LIS professionals must be well-versed with information management skills *i.e.* to integrate human resources, operations, systems, and financial management processes to produce an efficient and effective information service.

(*vii*) LIS professionals must have interview, communication and presentation skills. According to Muirhead[4]... in the ongoing routine administration of a library management system, technical skills such as hardware maintenance, programming and the physical operation of the computer centre were considerably less important than those duties which cast the systems librarians in the role of mediator and which therefore required highly developed communication skills—liaising with system suppliers, providing support for system users, documenting the system and training staff, etc.

(*viii*) LIS professionals must have leadership quality. It is one of the most efficient tools of management and organisational effectiveness required conflict resolution, problem solving and organisational change.

3. CONCLUSION

Libraries are facing new challenges, new competitors, new demands, new expectations and information queries from the users. LIS professionals are required to possess the knowledge and skill to handle the information technology challenges. LIS professionals need to be agile enough to their education, concepts, systems and services to the highly dynamic conditions and pressing need of the new millennium. They require a combination of professional skills, IT skills, and managerial skills. They have to be acquainted with the skills to cope with the challenges of electronic era.

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73

Information Communication Technology and Education

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ABSTRACT

Information and Communication Technology has influenced all walks of human life and education is no exception. More importantly, information has high prestige among writers, researchers, students and scientists. The flow of information is so rapid that it is beyond the comprehension of a subject specialist to have a birds-eye-view even on 10% of information published in his field and that is why, it is said, this is the age of information explosion. Global transfusion of information through telecommunication and other mechanism has become increasingly common. All this has been made possible by this enabling technology (IT). At this point it is important to know that information is not education nor is information necessarily knowledge although knowledge is based on information. Information is generated and consumed with such a pace that even a literate person is feeling as if he is illiterate when he is unable to cope up with the information explosion. This paper discused ways to cope up with this explosion. It suggests that IT can come to rescue. In simple language coping up with explosion of information is Information Technology.

1. INFORMATION TECHNOLOGY

Information technology involves finding, sharing and restructuring information in its diverse forms. It is because of speed of data processing, the storage capacity of computers and quick accessibility of electronically transmitted data, that we now

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live in global village with a world of information at our fingertips which is that no more than a few clicks of the mouse away. UNESCO consider that information technology (IT) communication as "Scientific, technological and engineering disciplines and management techniques used in information handling and processing, their application, computers and their interaction with men and machines and associated social, economical and cultural matters". According to Smith and Cambell (1982) "a mosaic of technologies, products and techniques have combined to provide new electronic dimensions to information management. This mosaic is known by the name of Information Technology. Thus, comprehensively can be defined as the use of hardware and software for efficient management of information *i.e.* storage and retrieval, processing, communication, diffusion and sharing of information for social, economical and cultural upliftment. (Sansaawal-2000)[6].

2. INFORMATION TECHNOLOGY AND EDUCATION

Information technology is dynamic in nature and vast in scope. It has the tremendous potential to improve and manage different aspects of education:

- Teaching
- Resource sharing
- Accessibility
- Global University
- Research
- Total quality management
- Professional development of teachers
- Distance Education
- Human Resource Development

2.1. Information Technology and Teaching

Teachers in the sphere of higher education mostly concentrate on giving information which is not the sole aim of higher education. The other important objectives are to develop:

- The power of reasoning and thinking,
- The ability of judgement and decision making,

- The sense of human values
- The study habits and the scientific temper and tolerance

It is very difficult to achieve the above basic objectives of higher education with the present method of teaching, infrastructure, class sise, availability of teachers and training etc. Contrary to this, the above objectives can be achieved to a large extent with the help of information technology in a more effective manner. The adoption and assimilation of information technology into the educational arena relates to five factors, "ICT's relative economy, effectiveness, efficiency, speed and access to data. For example, for convening a meeting of professionals in India and bringing three colleges from New York would easily cost about Rs 4 to 5 lacs on account of expenses on travel and accommodation. Moreover, a lot of time is wasted in to and fro journey. In contrast, hiring a VSNL vedeo-conferencing facility and linking up to New York would cost in thousands only for an hour with both end charges.

This way ICT can equip the teachers with recent and relevant information to perform their duties. In Indian context it can be achieved by making Internet system available in each and every education institution. In this context Government of India has decided to launch "Operation Knowledge, as part of the 'Information Technology action plan'. Under this plan computers and Internet facility shall be made available in every school, college and university for providing quality education. Dr. Sheshgari, former Special Secretary in the Planning Commission and Director General of NIC has come out with the idea of setting up of a large number of information technology mission which could get a total funding of Rs. 7000 crores. The ultimate aim of education is "sustainable development" to face the global competition. Information Technology must be used as a powerful tool to achieve that goal.

2.2. Information Technology and Resource Sharing

Due to price escalation and budget cuts there is recession and decreasing trend in investment in the education sector. Thus financial constraints have made planners, administrators, managers and implementers to think of alternative ways and means of resource development and management. One of the alternative

ways is to create a central facility which can be shared by students, teachers and researchers from different departments of the university. This concept of resource sharing exists in our country especially in sharing of literature/information amongst the sharing institutions. Application of information technology communication has made this concept a dream come true with the help of Internet facility. Internet has made it possible for everyone (whosoever is connected to it) to share the resources of the other institutions by way of consultation, advice, access to information and subsequently downloading of information, if required. It does not put any restriction to mode, type, duration, number of users, location of users, characteristics of users etc;

2.3. Information Technology and Accessibility

Information technology has shrunk the world and we are living in a small global village where one can talk to anyone, enter into any library, discuss any academic problem, share any idea, seek any information, search any information etc. All this has been made possible due to internet, E-mail, video mail, Cyber Café etc. Virtual universities have now come into existence where students are studying in virtual classroom. They need not travel to other countries but can complete their education while staying at their own places of residence. All this was not possible earlier. Thus, information technology has increased accessibility to information, advice, consultation etc.

2.4. Information Technology and Research

Research is quite common amongst industries, universities and research organisations. They are conducting mostly fundamental and applied research. The quality of research varies due to the disparity in available infrastructure. The universities are getting very little funds for carrying out research. Majority of universities do not have links with industries. Therefore, industries do not fund the research activities in universities. Today it is possible to enhance activities research in collaboration with the counterparts from other countries/institutions. Research is academic activity. The identification of Research problem, planning and carrying out experiments can be done by pooling the wisdom of all research workers of the team through the use of Internet. The research data sharing analysis and interpretation has improved to a great extent.

Even replication of research has become an easy task. It has improved the reliability of research findings. Once research quality improves, the development based on it is bound to improve. Thus, information technology can go a long way in improving research and development amongst the developing countries.

2.5. Information Technology and Global University

The traditional universities are to give admission to all those who possess eligibility and desire to continue higher education. To solve this problem open universities and distance education departments were established besides the opening of educational facilities by many foreign universities. All these facilities also became in sufficient in this age of high technology . "Universities on Internet" were established which have all good features of any good university and able to eliminate all limitations such as, number of students, courses, subject combination, holding of examination only once in annual system and with rigid schedule, unilateral methods of teaching, poor quality of instructional material etc. Such a university is called "Virtual University"

2.6. Information Technology and TQM

These days users as well as beneficiaries are not happy with the quality of higher education. It points out that there is a need to bring desirable change in the higher education system, namely, input process, output and feed back. For example, Ministry of HRD is planning to conduct one common entrance examination for selecting students for admission to various professional colleges situated in different states of India. Further, selection of various posts is done by advertising the posts of national level just to maintain the quality of input component of the system. Not only this, the curriculum is also designed by involving experts from different universities. Same way teachers from different universities are invited for teaching purpose, setting and evaluating question papers, evaluating the Ph.D. thesis, conducting viva-voce etc. All this is done with the purpose of maintaining the quality of process, output and feed back component of the system. Inspite of all this, the quality of higher education is not the same as expected by its beneficiaries. Here information technology can help in maintaining the total quality of the system. For example the curriculum can be designed by updating the information and by incorporating expert opinion

sought through the use of Internet. Each university should design the Website and make complete curriculum available on the website. This way TQM of international standard can be achieved in education. The application of information communication technology and its products in the field of education has tremendous scope.

The development of information communication technology has definitely improved the public availability of information. Access to all kinds of information, including bibliographic, reference, factual, numeric data and full text has been enhanced and extended. New technology has provided wider access to information. In view of the fact that information packaging technologies are still with the information rich countries, it is surprising that information technology will further widen the existing gap between information rich and the information poor. This will ultimately have a bearing on the relation between the developed and the developing countries. Therefore, it is all the more necessary for the information poorer countries to adopt new information technologies as quickly as possible which is essentially going to change their identity.

2.7 Professional development of teachers

To bring about quality in learning there should be good quality teachers. Learning is a continuous process and if we stop keeping in touch today we will be obsolete by tomorrow. In order to be an effective teacher, one has to update, orient himself with the latest developments in his discipline of knowledge and attain requisite professional trainings. This will enable a person to improve his professional capability. Earlier teachers had no concept of keeping one self current and attaining different professional trainings and it was said that a teacher is born but not trained. This belief does not hold good today. Now- a -days we find numberless teachers' training institutions, Academic Staff Colleges at state and national level, since there is flood of information generated in every field of knowledge and nothing is static. Every now and then changes do take place due to research activities taking place around the globe and therefore, at every stage a new discipline of knowledge emerges. Therefore, the human resource engaged in this sphere of activity need to be trained from time to time so that they are able to keep pace with the developments in their related areas and can

work at the maximum efficiency level. We call it continuous professional development programme for teachers. But the number of teachers is so high that the existing teaching institutions can not take care of professional development of such a large number of teachers. Some of the reasons are as under:-

- No quantitative and qualitative expansion of the existing training institutes
- Limited infrastructural facilities
- Limited number of training institutes
- Availability of inadequate fund
- Unwillingness of teachers to participate in professional development programmes
- Training provided outside workplace

All the above limitations can be taken care of by IT. The country can be divided into different regions and in each region a few resource centres can be established. These centres can be equipped with the latest IT gadgets like computer with Internet, CD Server, Audio video recording system etc. The teachers within the region can send specific requirements to the resource center and they inturn can provide required information / material to the concerned which can give a fillip to their professional development. Further experts can be identified and asked to teach the topic of their specialisation and video recordings can be prepared and made available to other learning institutions both for teachers and students. This can be utilised more by the institutions where there is shortage of competent teachers.

With the availability of internet in educational institutions, teachers can get education and training through experts of eminence. Even teachers can use this facility and update their knowledge by interacting with their counterparts in other universities both national and international. They can also get the desired information of their choice and prepare topics for effective teaching. Thus IT can help in the professional development of teachers to a great extent. Distance education was started due to the explosion of information, population and more demand of higher education ,the traditional higher institutions are not in a position to provide admission to every one who wanted it . It compelled the planners and administrators

to think of alternative ways to provide quality education. The correspondence courses in limited disciplines were started under distance education programmme. Reading material (in print form) was made available to students, supplemented by contact programmes of 3-4 weeks duration by the concerned university. Thus distance education and open learning concepts were floated and we have now state and Central universities to carry on this program. These institutions with the advantage of IT are supporting their programs through video instructional material, audio material, computer assisted information, internet facilities for literature searches etc. which has improved the quality of education. The UGC has started the networking of different universities and it is possible to share all available resources for imparting the quality of education to distant places. This has been made possible only by IT. The IT can be utilised for planning and managing resources, examination, teaching, learning process curriculum development, admission etc. more efficiently than what is being done today.

2.8 Human Resource Development

The progress and development of any nation depend upon human and material resources. The utilisation and exploitation of material resources for the development of nation depend solely on human resource. The properly trained manpower can help in proper utilisation of available material resource. Therefore, every nation is supposed to have database of trained manpower without which progress and development of any nation is not possible. Unfortunately at present neither the database of human resource nor material resource is available . It is now only possible through IT that we can develop this database which can be utilised to find those areas where very little or no trained manpower is available and the areas where surplus trained manpower is available. Having done this, it will be possible to monitor the process of development of manpower and rationalise keeping in view the requirement of the nation in that specific area. At present it may not be feasible for developing nations to create infrastructural facilities for training manpower in all spheres of knowledge. To develop excellent facilities, lots of funds are required which every nation can not afford *e.g* for teaching and research we need to have, a reasonably standard library with a balanced collection of books, standard national and international journals. But it is a hard fact

that universities are hardly in a position to continue with the subscription of journals due to financial limitations and escalation in the subscription cost. To overcome this problem IT can provide a solution with internet facility and participation in resource sharing through INFLIBNET, DELNET, CALIBNET etc. Similarly IT can help any nation to get the manpower trained at a very reasonable cost.

3. CONCLUSION

The above discussion makes it amply clear that information communication technology has not only made universalisation of education a dream come true but ensured competitive and quality education at all levels.

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74

Designing Web Based Learning Modules for People with Special Needs : Some Guidelines and Practices

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ABSTRACT

The issue of accessible Web design for people with disabilities and other special needs has recently become a topic of great concern. For Web-based Distance Education, the aspect related to the creation of accessible resources such as, Universal Design Principles, Legislation , Reaching the Widest Possible Audience, Accessible Design: Where Does it Begin ?, General Principles, Basic Strategies to Ensure Accessible Design, Choosing Courseware Tools have been discussed.

1. INTRODUCTION

Participants in online activities include an increasing group of users with sensory, physical or learning disabilities, for whom adaptive technologies provide a gateway to information and education. Current estimates suggest that approximately 20% of the population have some type of disability.[1] Legislation in developed countries supports development of accessible standards for Web-based resource development. Furthermore, today's technological environment is fostering public demand for accommodation of a growing number of user interface models, ranging from screen readers to palm pilots to telephone browsers. All of these point to the need for Web authors to increase their understanding of the principles and practices which support universal design.

2. UNIVERSAL DESIGN PRINCIPLES

Why should developers take the time to ensure that Web-based

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educational resources are based on universal design principles? There are several factors that should motivate us to learn about accessible design, and implement it in our online programming. The first is a fundamental ideal that access to education is one of our basic human rights. Accommodation of learners with special needs is part of the process of ensuring that high quality educational experiences are available to every individual.

We are currently in the midst of a rapid evolution in availability of adaptive technology that removes barriers to accessing information and education for people with disabilities. A potential learner may have differences in how they interact with a computer, including both hardware and software, input and output. A sensory impairment may result in a need to use screen reader software to hear the information instead of viewing it on a screen. Limitations in mobility could mean that the student uses an adapted keyboard to navigate the Web. However, these individuals are fully capable of participating and contributing to a learning community. Education delivered via the Internet provides an opportunity to level the playing field for learners with special needs through use of new technologies, in combination with thoughtful design of the user interface. The technology is available, but the onus now rests with designers to present Web-based resources in formats that are accessible to a full range of learners. As an extension of the principle of universal education, we must become aware of principles of universal Web design.

At present, the leader in establishing accessibility guidelines for page authoring is the Web Accessibility Initiative (WAI), a sub-committee of the World Wide Web Consortium (W3C). The mission of this group includes promotion of a high degree of usability for people with disabilities. To this end, the WAI is coordinating many organisations that have developed Web accessibility guidelines in the past, in order to develop a comprehensive and unified set of accessibility guidelines. The most recent set of authoring guidelines categorises, by priority, elements and formats to a void and recommends possible redundancies or alternatives, in an attempt to establish universal standards for accessible Web design.[2]

3. LEGISLATION

In several countries the Human Rights Code protects citisens

against any "discriminatory practice in the provision of goods, services, facilities or accommodation customarily available to the general public." [3]

In the US, the Americans with Disabilities Act (ADA) [4] legislation and the Rehabilitation Act 508 requirements for Federal Departments and Agencies require that Web resources must be made accessible to people with disabilities. The ADA directs organisations falling within its scope to provide appropriate auxiliary aids and services where necessary to ensure effective communication with individuals with disabilities, unless doing so would result in a fundamental alteration to the programme or service or is an undue burden.

4. REACHING THE WIDEST POSSIBLE AUDIENCE

In the field of education, we are all experiencing the exponentially increasing demand for provision of course related resources and documents via the Internet. Use of the Web for delivery of distance learning is finding an audience in the current "just-in-time" education environment, where customised programs and convenient professional development opportunities are valued by today's lifelong learners. In addition, students in traditional facilities-based courses are asking for the convenience of access to course resources, information, and communication with their instructors via the Internet. Library reference services are being adapted to take advantage of the possibility of Internet access to information systems and database mining tools.

We may have an image in mind of a "typical" learner, who sits at a desk using a conventional keyboard, mouse and monitor. But it is important to consider demographic trends, health trends and technological trends, to ensure that we are reaching the widest possible audience. An aging population, in combination with the demand for lifelong learning, has lead to an increase in the number of users who have some degree of vision impairment. Additionally, workplace environments have unfortunately resulted in a dramatic increase in the number of learners who suffer from repetitive strain injury.

The potential benefits of Web-based learning resources for students who use adaptive technologies are many, as the electronic delivery of information and resources permits translation into a

variety of modalities and formats. These benefits include:

(*i*) flexibility in the pace of learning, material can be presented in redundant, reinforcing or alternative formats *e.g.*, (*ii*) speech, print, graphics, etc.; material can be adapted to various learning styles; student can clarify, rehearse and review supporting materials without (*iii*) interrupting the flow of the learning session for classmates; issues of distance, transportation and physical accessibility are reduced, (*iv*) equal participation for students who use augmentative or alternative; (*v*) communication methods, as the method and rate of communication is (*vi*) transparent to fellow classmates; and greater opportunities for peer interaction and collaboration, and for (*vii*) student-instructor interaction and assistance

Another trend is the rapid development of alternative devices such as mobile computing devices, "hands-free" and "eyes-free" browsers and "virtual books" to access information and resources in contexts other than the conventional desktop workstation. Not all methods of accessing the Web incorporate a graphical pointing device such as a mouse. Web pages based on principles of accessible design should be navigable via keyboard or voice commands. While the functionality of these devices is determined by the product developers, strategies may be implemented to enhance access and avoid unnecessary barriers being created.

Forward thinking developers will recognise the need to plan for changes linked to demographic and technological trends. To this end, it is essential that educators and administrators are astute in their design of Web-based instructional resources, and in their selection of courseware tools. Building on a solid foundation which includes adherence to HTML standards and accommodation of a full range of interface models will increase the life span of the resources we develop, ensuring access by the widest possible audience at present, and in the future.

5. ACCESSIBLE DESIGN: WHERE DOES IT BEGIN?

A useful definition of accessibility is provided by Chuck LeTourneau, of Starling Web Services, an organisation that specialises in accessible Web design. He states:

"What does 'Web accessibility' mean? To me, it means that anyone using any kind of Web browsing technology must be able

to visit any site and get a full and complete understanding of the information as well as have the full and complete ability to interact with the site - if that is necessary"[5].

In order to understand the issues related to accessible Web design, developers need to first have a basic understanding of specific access systems that accommodate, replace or augment sensory and motor functions of users with special needs. These include voice recognition systems, alternative pointing devices, screen readers / magnifiers, and other devices. The following is a list of some adaptive technologies and examples of basic challenges to Internet navigation faced by users of these devices.

5.1. Screen Readers

This software is used by blind learners to access Web pages, electronic text and computer applications. This software allows all text to be read out from the menu, toolbar and directory buttons, and Web pages. Tab or Shift-Tab allows navigation through the Hyperlinks on a given page.

5.2. Screen Magnifiers

Screen magnification systems enlarge portions of the screen to allow learners with limited vision to access computer based materials.

5.3. Alternative Keyboards

These keyboards offer larger or smaller target areas for users with loss of gross or fine motor control. They may be switched to mouse emulation mode so that the arrow keys or numeric keypad of the same keyboard are used for mouse movements.

Mouse emulation can be somewhat slow or frustrating, although keyboard equivalents to tab through hypertext links which have been built into recent Web browsers are very helpful. Because the pointing device is less precise, users may need larger targets or increased spacing between targets.

5.4. On-screen Keyboards

This software allows the user to enter text and select buttons emulating menu functions from a display on the monitor. Users have a pointing device or a switch to select buttons.

5.5. Voice Recognition

The user speaks into a microphone to navigate software applications, surf the Web, and input text. Commands correlating to macro sequences may be created to customise usage for specific software or frequent tasks. Mouse control may incorporate a grid system.

A basic understanding of these commonly used adaptive technologies, is the first step in learning to design Web pages that will make information accessible to users of these adaptive technologies.

6. BEST PRACTICES FOR ACCESSIBLE DESIGN

Making the Web more accessible is largely dependent upon using HTML the way it was intended: to encode meaning and structure, rather than control layout and visual formatting. Some years ago, the introduction of graphical browsers, lead to a variety of new official and unofficial HTML formats which were quickly taken up by Web designers. Adaptation of the structure of HTML for aesthetic purposes compromises the accessibility of the site using non-visual, or non-conventional browsers. An example of this phenomenon is the case of the TABLE tag that was originally conceived to display tabular data, but has become an all-purpose tool for laying out magasine-type pages. The increasing use of graphics, non-standard HTML structure, and the introduction of dynamic elements such as Java applets and active-X controls has further compounded the challenges in designing universally accessible Web pages.

7. GENERAL PRINCIPLES

Knowledge of the following general principles, based on WAI approach to accessible design will help the designer to achieve greater level of accessibility in the learning resources being developed. [6]

7.1. Use structural elements as they were intended

On of the greatest barriers to accessibility is inappropriate use of structural markup to achieve visual formatting effects. Using markup improperly may create a barrier preventing users with specialised software from understanding the organisation of a page, and navigating through it effectively. Web designers may

be tempted to use structural markup to achieve a desired formatting effect, especially for viewing with older browsers. Common practices include use of tables for layout or a header to change the font sise. It is important to consider whether the formatting effect is so critical as to warrant rendering the page inaccessible to some users. Not everyone uses a conventional monitor and mouse to access the Web. A better approach is to use markup such as TABLE, UL, BLOCKQUOTE, etc. as it was intended, and use CSS to format visual effects for those learners using conventional desktop system. CSS is a forward thinking technology that assists the Web designer in separating structure from format, content from presentation. This accommodates users of adaptive technology, as well as users of new, mobile and portable Internet access devices.

7.2. Provide equivalent alternatives to auditory and visual content

When providing critical information in strictly visual, or auditory formats, be certain to include alternatives for those learners who may not be able to access these resources. A simple example is the use of th "ALT" attribute, of the <IMG> tag, providing an alternative text for users who are not displaying graphics. This will accommodate learners accessing Web resources with a screen reader, with graphics turned off because of low bandwidth issues, or those who are using devices which display text only. Scripts, sound files, objects, java applets, and other interactive components should also be rendered in alternative formats.

7.3. Add accessibility features to ensure pages can be navigated by keyboard only

As not all users can use, or will be using a mouse to navigate Web pages, good Web design means that the page can be accessed using only a keyboard or voice commands. Common pitfalls include use of image maps without ALT tags for each "hotspot." You can also use HTML 4.0 features such as ACCESSKEY and TABINDEX to make your pages easier to navigate using only a keyboard.

7.4. Ensure graceful transformation.

With some effort, Web designers can create pages that transform gracefully. Pages that transform gracefully will be accessible to a

variety of users despite any physical, sensory, and cognitive disabilities, work constraints, and technological barriers. Strategies already mentioned include separation of structure from format, providing textual as well as visual information, and creation of documents that do not rely on one type of browser or hardware. Pages should be usable by people using a keyboard , with small or low resolution screens, black and white screens, no screens, with only voice or text output, etc.

8. BASIC STRATEGIES TO ENSURE ACCESSIBLE DESIGN

With so many tools available , one is easily tempted to implement design elements that in the end may actually impede, rather than enhance, the learning process for computer users with special needs. The following tips, based on the Web Accessibility Initiative guidelines, will assist in ensuring that your Web site is reaching the widest possible audience.

8.1 Images and animations

Use the alt attribute to describe the function of all visuals. Since text content can be presented to the user as synthesised speech, braille, and visually-displayed text, this improves accessibility for people who cannot access visual information or written text, including many individuals with blindness, cognitive disabilities, learning disabilities, and deafness.

8.2 Image maps

Use client-side MAP and text for hotspots. Client-side image maps are preferable because information is located in the HTML document and can be accessed using alternative browsers. Server-side image maps may require use of a mouse or other pointing device. Text equivalents are helpful for the reasons outlined above.

8.3 Multimedia

Provide captioning and transcripts of audio, descript ions of video, and accessible versions in case inaccessible formats are used. Although some people cannot use movies, sounds, audio enhancements, etc. directly, they may still use pages that include equivalent textual information to the visual or auditory content.

8.4 Hypertext links

Use text that makes sense when read out of context. Link text

should be meaningful enough to make sense when read out of context — either on its own or as part of a sequence of links. For instance, do not use "click here." Link text should also be terse.

8.5 Page organisation

Use headings, lists, and consistent structure. Use CSS for layout and style where possible.

Use structural markup to aid navigation rather than for a presentation effect (*e.g.*, using a table for layout or a header to change the font sise). Correct use helps learners with specialised software to understand the organisation of the page and to navigate through it.

8.6 Tables

Make line by line reading sensible. Summarise. Avoid using tables for column layout.

Tables used to lay out pages and some data tables where cell text wraps pose problems for older screen readers that do not interpret the source HTML or browsers that do not allow navigation of individual table cells. These screen readers will read across the page, reading sentences on the same row from different columns as one sentence.

9. CHOOSING COURSEWARE TOOLS

An exponentially increasing number of educational courses, from all sectors, are being offered over the Web. This has spurred a growing industry of software tools to assist in creation of Web-based curriculum and in performing class management tasks. Web server software such as WebCT, Top Class, CourseInfo, Virtual-U and other programs will take HTML documents, along with other media and resources, and quickly organise them into a framework specifically designed for delivery of Web-based courses.

Courseware products cater to educators who are unfamiliar with programming, allowing easy integration of password protection, interactive activities, tracking of student progress, etc. Generally, the interface is fairly simple for the designer, as many use templates and wisards extensively to assist in course content creation. Step-by-step guides support creation of a range of components, from the course home page, to bulletin boards, to

quisses and marking systems. Multimedia components, such as images or audio files, are generally created externally in a specialised software program, and imported. Many feature a designer interface which is driven by a program residing on the server, accessed through a browser. While this is convenient in terms of software access and cross platform issues, the automation can give the educator less control of the final formatting of the HTML

Thus, while Web-based distance education programs built on courseware platforms address geographical and cost barriers, they frequently present access barriers to students with special needs. Ironically, very few include basic accessibility features described above, effectively excluding those individuals who stand to benefit most from new technologies.

10. CONCLUSION

Looking at the future of computer interface and emerging technologies the motivators behind development of accessible Web-based learning resources are many. Improving accessibility begins with increased awareness of the potential barriers. As educators, we must be astute in selection of courseware tools and encourage use of products and methods that allow development of accessible resources based on principles of universal access. Just as wheelchair ramps to buildings have become the norm in architectural design, accessible Web design must become a basic consideration in the design of Web-based learning resources.

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75

Engineering College Libraries Under the Jurisdiction of Kuvempu University: A Survey

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ABSTRACT

An attempt has been made to know the prevailing condition of the Engineering college libraries under the jurisdiction of the Kuvempu University. The study found that almost all the libraries are kept open for twelve hours per day for their users, and it is found that there is an inadequate of professionally trained staff as well as inadequate of finance to meet the diversified requirements of their users. Consistently good number of books are added in BIETand JNNCE whereas there is a moderate addition in UBDT and AIT .The same condition is applicable as for as subscription of periodicals are concern; all the libraries are following DDC and AACR for their technical process of documents. The concept of resource sharing is totally absent in all the colleges, but other services such as Lending, CAS, SDI, Reprographic, Internet and E-mail are offering.

1. INTRODUCTION

Information serves as treasures and fountains of knowledge especially in the realm of higher education. As we know education in higher and technical level is no longer solely teacher oriented. A good library is a prime requirement of an engineering college

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in order to fulfill its objectives of dissemination of information. A great teacher certainly influences library consciousness of his students. Alternatively adequate library facilities become imperative for student to go beyond the classroom lecture and graze in the wide and bountiful pastures of written records in libraries. Library is essentially a service institution. Its prime duty is to disseminate the information according to the diversified requirements of the users. The traditional function of library services involves a variety of activities on the part of the library. To achieve its goal and realize its policies, a library undertakes different kinds of services. The college routine works can broadly be studied under two heads i.e. work beyond the scene and work with readers. Libraries have to accept, to a large extent, the basic objectives of their institution, which are best, considered under the traditional heading of teaching and research. Promotion and public relation are to be considered as the focus for communicating to the user community.

2. OBJECTIVES AND METHODOLOGY OF THE STUDY

The main aim of the study is to know the prevailing condition of Engineering colleges under the jurisdiction of Kuvempu University as for as its resources, services, manpower, finance etc. are concern.

In order to collect the required data for the study a questionnaire was designed and circulated to all the Engineering College Libraries under the study. Eighty percent (80%) of the duly filled in questionnaire were returned and the same has been considered for the database of the present study.

3. ANALYSIS OF THE STUDY

After getting the required data, the same has been tabulated on the form of tables for discussion. Table-1 deals with the year of establishment of the colleges. While observing the table it is clear that the UBDT college of Engineering Davanagere was established in the year 1952 as a government college and the same was converted into university college in the year 1992, since then it is working under the supervision of Kuvempu University. In the year 1979 Bapuji Education Society was established another Engineering College at Davanagere. In the year 1980 two more engineering colleges were established under the jurisdiction of

Kuvempu University namely JNNCE at Shimoga by National Education Society and another AIT at Chikamangalore by Adhichunchanagiri Educational Trust.

Table-1.

Year of Establishment of the engineering college Libraries

Sl. No.	Name of the Institution	Year of Establishment
1	UBDT Davanagere	1952
2	BIET Davanagere	1979
3	JNNCE Shimoga	1980
4	AIT Chikamagalur	1980

Working Hours of the Engineering colleges libraries

Table-2 clearly shows that the working hours of the engineering colleges under the study. UBDT College of Engineering library is kept open for its readers from 10.00 A M to 5.30 P M i.e. seven hours per day. On the other hand all other college libraries under the study function 12-13 hours per day for the benefit of their users. Further the BIET and JNNCE college libraries are kept open in holidays from 9A M to 2P M.

Table-2 : Working Hours of Engineering College Libraries

Name of the Institution	During Holidays	During week Days
UBDT	10.00 AM to 5.30 PM.	-
BIET	9.00 AM. to 9.00 PM.	9.00 AM. to 1.30 PM.
JNNCE	8.00AM.to 9.00 PM.	9.00AM. to 2.00 PM.
AIT	9.00 AM. to 8.00 PM.	-

Manpower

Manpower is essential for running any institution so as to library also. Professionally trained manpower is playing a vital role in the dissemination of information as well as organization of libraries. Table-3 indicates a clear picture of manpower management of Engineering College Libraries under the study. It is clear from the table that one each professional are working at UBDT and AIT colleges and three each Professionals working at BIET and JNNCE colleges, one each semi professionals are working at BIET an AIT colleges respectively. On the other hand

four non-professionals were posted at UBDT fallowed by fourteen at BIET, two in JNNCE and one at AIT respectively.

Table- 3. Manpower of Engineering College Libraries

Sl.No	Staff	Existing				Vacant			
		UBDT	BIET	JNNCE	AIT	UBDT	BIET	JNNCE	AIT
1	Professionals	1	3	3	1	1	-	-	-
2	Semi-Professionals	-	1	3	1	-	-	3	-
3	Non-Professionals	4	14	2	1	4	-	2	-

The study reveals that he present manpower structure is inadequate to satisfy the variety of informational requirements of their user community. Single person manages especially the UBDT and AIT colleges and there is no alternate staff to look after in the absence of the librarian. So it is suggested that the concerned authorities should consider the libraries are the heart of the institution and provide more and adequate staff to provide the efficient and exhaustive services to their users.

Library collection

Collection development implies selection, acquisition and evaluation of the library collection in order to see that both print and non-print materials that are available in a library are really useful to the clients. Collection development therefore dispense away with arbitrary selection and acquisition of documents. Similarly it envisages periodic evaluation of the library stock both to improve its collection as also to weed out the irrelevant, outdated and unnecessary documents from the library. It also means that users' needs should be kept in mind while building up the collection.

While observing the Table-4 it can be ascertained that BIET and JNNCE college libraries are adding consistently a good number of documents to their library whereas on the other hand UBDT & AIT college libraries are adding moderate number of documents to their existing collection, this is mainly due to the inadequate of budgetary provision to their college libraries.

Table-4

Annual addition of Books in Engineering College Libraries.

Year	Annual Addition			
	UBDT	BIET	JNNCE	AIT
1996	800	636	1631	223
1997	416	1223	2275	490
1998	165	957	1960	134
1999	163	1810	2924	2889
2000	119	2009	6034	5579

On the other hand subscription of periodicals are concern the Table-5 clearly indicates that again BIET and JNNCE colleges are subscribing more number of journals then compared to UBDT and AIT colleges as for as Indian and foreign periodicals are concerned. Further it is stated that due to inadequate financial provision UBDT and AIT colleges are not able to subscribe more number of periodicals. Hence it is suggested that the concerned authorities of UBDT and AIT colleges are to provide adequate finacial provision for the acquisition of books and subscription of periodicals to their college libraries.

Table-5

Journal Subscription by the Engineering College Libraries

Year	Indian				Foreign			
	UBDT	*BIET*	*JNNCE*	*AIT*	*UBDT*	*BIET*	*JNNCE*	*AIT*
1996	4	50	51	35	10	40	49	12
1997	4	70	67	38	10	64	59	12
1998	4	70	66	40	36	70	54	8
1999	4	80	80	39	10	81	52	6
2000	4	81	115	34	10	91	55	6

Financial Management

Finance is very essential to run any institution so as to libraries. While observing the Table-6 and7 it clearly shows that the budgetary allocation as well as the actual expenditure of the libraries under study. The present budgetary provision is inadequate to meet the diversified requirements of the user

community. To same extent BIET and JNNCE College are getting moderate financial provision whereas on the other hand UBDT and AIT are getting inadequate finance. Hence it is suggested to the concerned authorities to provide adequate financial assistance to their library for providing efficient and effective library and information services to their clients.

Table-6

Library Budget in Engineering College Libraries

Year	Library Budget			
	UBDT	BIET	JNNCE	AIT
1996	3,00,000	10,00,000	3,00,000	1,50,000
1997	2,50,000	10,00,000	4.50,000	1,86,000
1998	2,00,000	10,00,000	4,50,000	1,08,000
1999	1,50,000	10,00,000	6,50,000	6,26,000
2000	1,25,000	10,00,000	16,00,000	12,40,000

Table-7

Library Expenditure Engineering College Libraries

Year	Library Expenditure							
	UBDT		BIET		JNNCE		AIT	
	Ex.on Books	Ex.on Journals	Ex.on Books	Ex.on Journals	Ex.on Books	Ex.on Journals	Ex.on Books	Ex.on Journals
1996	3.0	1.0	1.7	1.0	2.14	1.19	0.74	0.76
1997	1.5	1.0	3.65	2.1	3.54	1.45	1.03	0.83
1998	1.0	1.0	4.44	2.56	3.10	1.49	0.18	0.90
1999	0.5	1.0	3.36	2.93	5.40	1.70	0.51	1.13
2000	0.3	0.9	4.96	3.68	12.38	2.02	10.99	1.40

Technical Service

Table-8 shows that the use of classification schemes and cataloging codes at their respective libraries. It can be observed from the table that all the Libraries under the study except AIT are following Dewey Decimal Classification scheme to classify their collection. On the other hand UBDT college library is fallowing Ruuganathan's classified catalogue code for preparing

catalogue cards. whereas other colleges under the study are fallowing AACR-2.

Table-8

Classification and Cataloguing Code used by Engineering College Libraries

Name of the Institution	Classification Scheme Used	Cataloguing Code Used
UBDT	DDC	CCC
BIET	DDC	AACR-II
JNNCE	DDC	AACR-II
AIT	—	AACR-II

Student strength

Table-9 gives a clear picture about the total strength of the colleges. The strength is varying from college to college depending upon the number of branches in their colleges.

Table-9

Student Strength of the Engineering Colleges

Year	Student Strength			
CollegeName	UBDT	BIET	JNNCE	AIT
1996	1300	1622	1300	400
1997	1300	1552	1300	430
1998	1300	1552	1300	460
1999	1300	1552	1860	520
2000	1300	1612	1860	520

Library and Information services

Library is a service institution. Basically it is existed to serve the clients. According to the user's requirements, curricula of the institution each library has to plan for its services. Table-10 indicates clearly about the existing service facilities in the college libraries under study. All the colleges under the study are providing lending services to their clienteles. Surprisingly no library under the study is undertaken library co-operative activities. CAS and SDI services offered by all colleges whereas UBDT and AIT colleges are offering indexing and abstracting services. Except UBDT all other colleges under the study are

providing reprographic services to their users. Only BIET and JNNCE college libraries are offering Internet and E-mail services to their clienteles.

Table-10

Library and Information Services in Engineering College Libraries.

Services	UBDT		BIET		JNNCE		AIT	
	Yes	No	Yes	No	Yes	No	Yes	No
Lending	✓	*	✓	*	✓	*	✓	*
Inter-Library Loan	*	✓	*	✓	*	✓	*	✓
CAS	✓	*	✓	*	✓	*	✓	*
SDI	✓	*	✓	*	✓	*	✓	*
Abstracting and Indexing	✓	*	*	✓	*	✓	✓	*
Reprographic	*	✓	✓	✓	✓	*	✓	*
Bibliographical	*	✓	*	✓	*	*	*	✓
Internet	*	✓	✓	*	✓	*	*	✓
E-mail	*	✓	✓	*	✓	*	*	✓

Inter-library loan is an important service in the library, because no library is self sufficient to fulfill all the requirements of their users. Each library has to depend on the other library. It is suggested that all colleges come together and frame a policy on the library co-operation and share their resources for the benefit of their users.

4. CONCLUSION

To conclude the existing situation is far from satisfaction. In the absence of library co-operation inadequate of financial provision, inadequate of manpower facilities and inadequate of other infrastructure facilities it is very difficult to provide efficient and effective library and information services to their user community.

So it is suggest to the concern authorities that to consider the libraries as an important component of the college and provide all necessary requirements in order to implement the objectives of the present institution effectively, efficiently and scientifically to fulfill the information requirements of the students and teachers of the Engineering Colleges.

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