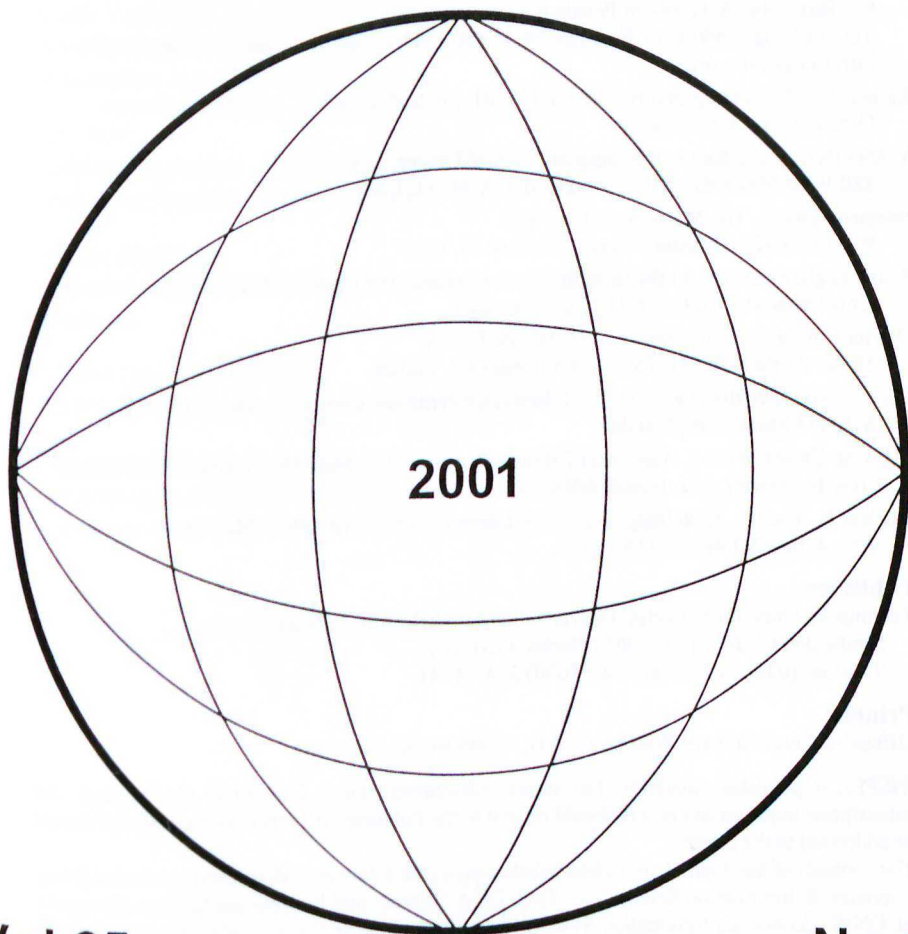


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BRINGING THE LIBRARY RIGHT INTO THE WORKPLACE: A CHALLENGE AND A TOOL OF SURVIVAL FOR A TELECOMMUNICATIONS LIBRARY*

By Joycelyn M. Jaca

As today's big corporations struggle to survive and thrive in a period of ever-increasing change, the need for rapid and large-scale performance improvement has never been more difficult. The Philippine Long Distance Telephone Company (PLDT), frequently called the "telephone giant", is one of the many corporations that experienced the buy-outs and mergers phenomena. The years 1998 and 1999 were periods of transition, during which PLDT undertook measures to make itself leaner and fitter. It was during the transition when the PLDT Vice President for Personnel Management and Development, Mr. Emiliano Tanchico, and I decided to "bring the library right into the workplace".

The PLDT Library before the Transition

The PLDT Library in 1998 occupied a very small space in the darkest corner of the second floor of the two-story training center. There were about 3,000 titles in the shelflist, fifty percent of which were on-loan and were already long overdue, and about seventy percent of the total were outdated. Three computers were used for word processing, spreadsheets and catalog records on CDS/ISIS. There were two telephones but there was no fax machine. Employees who were lucky enough to know that there was indeed a library had to brave the Metro Manila traffic to personally go to the library, search the card catalog and borrow books. Although former librarians bought good books, the library's collection did not improve much because a great number of expensive materials were not returned and no efficient tracking system was in place.

The Options

While the desire to automate was a given, several options were considered by the management to address the problems that confronted the library... and some "mistakes" were made along the way. One of which was hiring a consultant who

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re-catalogued two-thirds of the previously DDC-classified materials and used Macrothesaurus instead of LC. Another error was the creation of a CDS/ISIS database without adopting MARC.

Other options considered were: in-house development of a library system using Visual Basic, hiring another consultant who will automate the library, outsourcing cataloging and indexing, merging the library to the documentation unit of HRD, and many more. For the cynics, another option would just be getting rid of the library.

Building a Grand Vision

When I joined the Company in the last quarter of 1998, I myself had no idea on what to do exactly with the PLDT Library. I had been working at the University of the Philippines College of Science Library, but I was not a professional librarian; and up to this time, I am still not a licensed librarian. I was not even sure if the decision to accept the job offer to become the Information Resource Administrator of the only telecommunications library in the country was right or not. The only thing that I was sure of at that time was that, just like the Little Prince, I believe that "you are not given a wish, without giving you the power to make it come true".

I knew my limitations, but I also knew right from the start that my superiors and I had a shared vision - and it was the grand vision to develop the PLDT Library into a state-of-the-art telecommunications information resource center. A shared vision that provided focus and energy to what we want the library to be and inspired a commitment from us and every member of the staff to achieve it. We wanted to be the "preferred telecommunications library" and to achieve this, we set the following goals:

- * To preserve, optimize and improve information resources provide to library users, especially on telecommunications and business
- * To utilize existing and emerging technologies to provide timely and relevant information
- * To develop and provide new value-added services to meet information needs
- * To create and maintain a library homepage
- * To continue to support corporate training activities

Creating a Compelling Case for Development

Convincing other people, particularly those who have decision-making powers is never easy when you are introducing change. The only way possible for us to get

support was to create a compelling case for development. We articulated the rationale, goals, scope and the return of investment (ROI) of the library development plan in a way that made it compelling to the Company's key IT and budget decision makers. The computation of ROI included savings in the use of employee time and transportation expense and savings from efficient tracking of library materials.

Managing Development in an Integrated Fashion

After getting the nod of the executives and securing the necessary budget for the development plan, comes the implementation. The development plan covered the revamp of the following services:

- * Collection Development
- * Cataloging and Indexing
- * Serials Monitoring and Control
- * Circulation
- * Reference the introduction of the following:
- * Internet and Multi-media
- * Library User Education

and the launching of:

- * Marketing and promotion of library services
- * Library Research, Evaluation and Planning

to ensure that the entire program achieves its goals. Additional project employees were recruited, trained and dedicated to the task at hand. The library was also given a new home, a 400 square meter-room, complete with new tables and chairs, carrels and shelves.

The reorganization and automation of the library services were very ambitious and complex to manage. The process included re-cataloging of the entire collection using the US Library of Congress Classification Scheme, and changing of the book labels, pockets, covers, and cards.

Part of the approved development plan was an integrated library system concept and a timetable for selecting, acquiring and installing the integrated library system.

The PLDT Integrated Library System Concept

The desired system for PLDT is an online, real-time integrated library system for internal operations as well as an information access system that presents a single

user access to a number of databases, systems, and services, including: actual catalog, digital information resources via the Internet, subscription database services, electronic reserve, and authentication.

The end-user client includes a World Wide Web browser client software. The user must have capabilities for searches of the virtual catalog and a variety of other databases accessible principally and primarily via Z39.50 supplemented by use of other standardized or proprietary protocols, agents, or search engines which provide coverage of databases, systems, and services of interest to PLDT. The user must be able to invoke the display of holdings, status, and availability information for an item or items of library material.

The system described in the concept paper is an integrated library and information access system whose design is based on open-systems and established industry standards and takes into account the basic interrelationships of bibliographic and other data and processing functions in library systems and services.

Time Table

Phase I Hardware and Software Acquisition

- * Scouting for the suitable Integrated Library Software
- * Request for information from eight companies
- * Request for proposal
- * Product demonstration and evaluation
- * Actual purchase

Phase 2 Implementation

- * Installation
- * Staff Orientation/Instruction
- * Testing
- * Training

Phase 3 Database Creation

- * Item Inventory
- * Barcoding
- * Encoding/Editing

Phase 4 Functional Integration/Actual Operation

- * Output Analysis/Functional Analysis
- * System Customization
- * Revision of Policies
- * Documentation

Phase 5 Evaluation

We selected the Library.Solution, the integrated library system developed by The Library Corporation (TLC), West Virginia. After several meetings and long hours of deliberation and careful study of all the offers that we received, we reached the conclusion that the Library.Solution is the right system for us.

Engaging and Mobilizing Leadership

During the process of implementation of the development plan, it is of great importance to get the support of executives and influential people in the company.

If direct involvement is not possible, endorsement from upper and middle management will surely make the task of the library administrator a little easier. Even though the project has just started, it is best to talk about it, explain the project's goals, discuss its benefits, and ask for suggestions and comments from the bosses.

In our experience, the executives who first heard about and understand the automation plan and those who in one way or another became involved, either in the evaluation process or in the approval, were the ones who helped us "promote" and market the new library system. The Center Head of the Information System Operations, for example, was very supportive of the library automation project (and is still supportive of the library now) because he knew from the very start, what were the objectives of the project.

Engaging and Mobilizing the End-Users

In the course of implementation, the end-users of the PLDT Library helped us by giving their suggestions, by telling us what were their expectations, and by letting us know of their actual needs. We also asked for copies of the employees' research outputs, project proposals, homegrown training manuals and brochures/pamphlets that they developed, to become part of the library collection. Since we were not able to conduct an information needs analysis before the implementation of the development plan, the inputs coming from the end-users themselves helped the

library team to take-off and proceed with enough confidence that we were doing the right thing.

When we introduced the changes in the library policies, we did not receive complaints, maybe because people were only too happy to see that their library is finally growing --- and it's growing beautifully!

Implementing New Value-Added Services

Perhaps for libraries in developed countries, the value-added services I am talking about are no longer new, but in the Philippines, most libraries still stick to traditional policies and services. The following are the new services that our library offers to our users:

*** Document Delivery**

Since our motto is "bringing the library right into the workplace", we decided to get rid of the policy that requires users to go to the library to borrow books. Users may request that answers to their reference queries be sent to them by fax, e-mail attachment, or through our mailing service.

*** Online Public Access Catalog (OPAC) and Online Borrowing**

The OPAC is accessible via the corporate intranet, and this allows our users to browse the catalog and borrow books online. The books are delivered to the office of the borrower within 24 hours through the mailing service.

*** Computer-Based Training (CBT)**

The library houses the CBT Campus which is also accessible via the intranet. Employees who wish to attend IT training need not leave their respective offices because they can train themselves using the CBT. The PLDT Library subscribes to over 200 titles of IT Training Courses.

*** Reference Service Through E-mail**

We answer reference questions sent by e-mail. Those who are not yet ready to use the Online Public Access catalog can also borrow and renew library materials through e-mail.

*** Interlibrary Loan**

When materials being requested are not found in the PLDT Library, assistance from neighboring corporate and academic libraries may be requested.

*** Internet Access**

Since not all employees have Internet browsing privilege, the library offers PCs that can be used for web surfing. When users can not come to the library, they may request through phone that an Internet search be made for them.

Bibliographies/Suggested Readings

The library can provide users with bibliography or list of references/suggested readings for specific topics.

* Photocopies of Telecom Newsletters

The library subscribes to leading telecom newsletter and these newsletters are photocopied and distributed to executives who requested to be in the mailing list.

* Efficient Library Homepage

The PLDT Library Homepage aside from providing information about the resources and services of the library, provides useful links to telecommunication resources, government databases, and it also features PLDT corporate news.

Bringing the Library into the Workplace" as a Survival Tool

The motto, aside from being a challenge and an inspiration becomes a survival tool for the corporate library especially during these times when reorganization, cost cutting, and streamlining are on going. The motto is a clear response to the "call for libraries and librarians to reinvent themselves" in order to survive.

The PLDT Library now enjoys the benefits that the two years of hard work brings. The employees and executives welcomed the re-birth of the library with open arms. Although we have not yet reached the entire 13,000-strong PLDT population, we are satisfied with the rapid increase in library usage, with the growing popularity of the services that we offer and with the amazing concern and cooperation shown by our users.

We believe that as long as we maintain the image of the library as a learning tool, a strong support to corporate development, and a significant agent of information dissemination, the corporate library will always be considered a necessity and a valuable asset.

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INFORMATION RESOURCE SHARING MODELS IN DEVELOPING COUNTRIES: A NETWORK EMERGING FROM THE WORLD BANK SUPPORTED ENVIRONMENTAL MANAGEMENT CAPACITY BUILDING PROJECT*

By Surekha Kaul

Abstract: Managing environmental knowledge, disseminating it and building capacity for its efficient use is as important as creating knowledge. The paper aims at examining the use of information resource sharing networking in the area of environmental studies in developing countries. The paper has been divided into five sections. First section discusses the concept and rationale of information and resource sharing in the modern society. Second section identifies linkages between the information and communication technology, information resource sharing and the networking models. Third section explores the differences in the developing and developed countries in information resource sharing and networking. Fourth section deals with the networking in environmental studies in India, a developing country. Fifth section examines the building up of Information Sharing System which is vertically and horizontally integrated across institutions working in the area of Environmental Economics under the World Bank Capacity Building Project. It is our contention that this is an important component in the area of Environmental Economics. Sixth section presents the concluding observations.

Introduction

Knowledge is critical for development. Poor countries differ from rich ones not only because they have less capital but also because they have less knowledge. Economic growth in the rich-industrial society has occurred largely by extensive replication of industrial activity, based on intensive use of fossil fuels and generally of the earth's resources. These industrial activities have reached at levels from where it threatens the atmosphere of the planet, its bodies of water and biodiversity. If the developing countries follow the same path of economic growth, it will prove to be disastrous for the planet and its environment. They need a sustainable development strategy, which not only protects the environment but also improves it while promoting economic growth. Better environmental outcome requires more knowledge about environmental impacts, newer technologies and

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environmental performance. Managing environmental knowledge, disseminating it for its efficient use is as important as creating such knowledge.

Are the developing countries managing and disseminating environmental knowledge for its efficient use by designing and building information resource sharing networking in the area of environmental studies? Is the information resource sharing networking in developed countries different from that of the developing countries? Are these information resources sharing networking effective in achieving their objectives? These are some of the questions, which need to be investigated. The paper aims at examining these issues.

Information and Resource Sharing in Modern Society

The voluminous growth of published documents in the recent past, increasing cost of information sources, technological advancements that offer newer methods of information processing, retrieval and dissemination are some of the factors which have made resource sharing a necessity. The Library co-operation is a very old concept and a form of resource sharing. There are large instances of such co-operation among libraries in the library literature (Kaul, 1999).

Need of resource sharing was realised by libraries a long back. Besides entering into inter-library loan practice, libraries also thought seriously of resource sharing in many other areas, such as co-operative acquisition, co-operative cataloguing, co-operative classification, etc. Inter-library loan has been practised as one of the most popular resource sharing activity amongst libraries. Inter-library loan in a traditional library is severely affected by barriers of information communication, such as apathy of the lending library, distance, language, time etc. A computerised inter-library loan system overcomes these limitations.

For resource sharing, the participating libraries need to come together and co-operate in two broad areas: (a) Developing the collection on shared basis, and (b) Developing services for exploiting such collection (Dhawan,1999). Developing the shared resources is of great importance and central to the concept of resource sharing. In developing the shared resources, the focus is first on eliminating duplication in the acquisition of various participating libraries to the extent possible. Thereafter, the focus is on the selection of such publications, which the participating libraries agree to share, and later on their acquisitions. The efforts of participating libraries in developing the shared resources are, therefore, directed in two distinct directions: (a) Rationalisation, and (b) Acquisition. There are several limitations to the resource sharing in the print environment as it existed till recently: a) open access to shared resource not feasible; b) service depends upon library performance; c) access to shared resource at a cost.

User services are critical to the resource-sharing programme for its performance and effectiveness in providing access to shared resources. The libraries as are required to organise and provide the user services are not always fully equipped to meet such obligations. However, modern information technology has made the task of resource sharing very simple and convenient. The new technology brings forward to the information field many products and services which have changed the nature of fundamental library objectives and operations. There are two technologies that have contributed to these revolutionary changes. These are Computer technology and Telecommunication technology.

Information and Communication Technology, Resource Sharing and the Networking Models

Over the last two decades the libraries have witnessed impact of information technology that has been effecting the structure of the services to a great extent. Moreover, the problems of space, standardization, professional development of the staff, challenges posed by new technologies, drastic cuts in the library budgets have aggravated problem of the present day librarianship. However, the solution to the problems of information explosion, ever changing needs of users, increasing amount required for subscription to same number of periodicals, shrinking library budget, and devaluation of rupee and its impact on the library acquisitions can best overcome upon certain level by the following means: a) Use of computer and communication networks for resource sharing; b) Use of national and international databases through communications networks; and c) Introduction to full text CD-based systems.

Various Resource Sharing networks have been observed at local, regional, national and international levels. Normally, three levels of national resource sharing networks exist: a) Local: Information is stored in the local libraries in the form of Union Catalogue for local collection available in local libraries. b) Regional: Information is stored in regional libraries and services are provided on broad subject area basis. c) National: National Union catalogue is prepared on national basis and services are provided to users based on national resources. Given the wide scope for exploiting resources and facilities available in the participating libraries, it is possible to work out a number of models for developing resource-sharing programs. There are four existing models, which have been presented in table 1.

Centralized Collection Development and Services at National, or Regional Level

This model aims at providing the cooperation between libraries, which are geographically scattered within a region or the country. The resources, which the

model intends to share, are acquired centrally and stored at a single site. For running the proposed facility, the participating libraries contribute towards the capital funds and the recurring funds. Grants are also sought from the government and private agencies for raising capital fund. The facility provides for an organizational structure for its control and governance. The structure also includes an apex body. Creating a new facility is central to the concept of this model. National Lending Library, UK illustrates the example of such a model.

However, in true sense of the term latter is not the right example. National Lending Library, UK, is not based on the concept of library cooperation. It is a facility maintained and controlled exclusively by the National Library, UK. The subscribing member libraries are not its partners but its end users. They have no role to play in building its collections. Their role is limited to that of a consumer.

Centralized Collection Development and Services by Subject

This model aims at developing the specific subject collection of documentary resources on shared basis. City, region, or the country may limit the geographic distribution of libraries cooperating in such a venture. The subject collection is acquired centrally and stored at a single site. Membership fee and grants from the government and private agencies (Dhawan, 1999)

Constitute the main source of funds to support and sustain such a facility. Examples of such a model result in consortia. National Science Library at INSDOC, New Delhi (India) which once had the mandate to develop a complementary collection of journals in science and technology, is also cited as an example illustrating this model. However, this example is misplaced since this is not a venture used to provide funds for purpose. The user libraries are its consumers and not partners.

Table 1: Various Model to Resource Sharing

Model	Aims and Funding	Examples
1. Centralized Collection Development and Services at National, or Regional Level	Resources: acquired centrally and stored at a Single site. Funding: Contribution by Participating libraries. Grants are also sought from government and private agencies.	National Lending Library, UK
2. Centralized Collection Development and Services By Subject	Resources: Subjects specific collection of documentary resources. Acquired centrally and stored at a single site City, region, or country may limit the geographic distribution of libraries. Funding: Marketing of services and grants from the government and private agencies.	National Science Library at INSDOC, New Delhi
3. Centralized Collection Development at Organizational Level	Resources: Libraries belonging to a single bigger organization collaborate. The shared collection is acquired centrally at a single site. Funding: Organization backing the Library provides funds. The participating libraries may also contribute towards the central funds	CSIR, DRDO, DOE, ISRO
4. Coordinated Collection Development at Institutional Level	Resources: Eliminates duplications. Serves at the level of participating libraries. The geographical area of cooperation could confine to a city, region, or country. Funding: The individual libraries determine their level of support. The higher their budget the higher their support. User libraries pay for the services they avail of.	DELNET, BONET and MALIBNET

Centralized Collection Development at Organizational Level

This model aims at developing a shared collection of documentary resources by limiting the scope of cooperation to libraries belonging to a single bigger organization such as the Defence Research Documentation Organization (DRDO), Department of Electronics (DoE), Indian Space Research Organization (ISRO) and Centre for Scientific and Industrial Research (CSIR).

The shared collection is acquired centrally at a single site. The participating libraries contribute towards the central funds for building the shared collections as well as for providing services

Coordinated Collection Development at Institutional Level

In this model a group of participating libraries take the initiative to co-ordinate their acquisitions. Their objective is to eliminate duplication in acquisitions to the

extent it is possible. Further, the member libraries undertake to give services such as information access and document delivery. This model leads to the concept of decentralized development of collection at the level of participating libraries and also to decentralized system of giving services. The individual libraries, participating in the programme, determine their level of support to the programme for building the shared resources. The higher their budget, the higher is their support. User libraries are required to pay for the services they avail of. The geographical area of co-operation could confine to a city, region, or country. This model is in operation in most of the resource sharing programmes started by various library networks such as Delhi Library Network(DELNET), Bombay Library Networking(BONET), Madras Library Network(MALIBNET) and Information Library Networking(INFLIBNET) (Dhawan,1999).

Resource Sharing in Developed and the Developing Countries

Library networks have grown mostly during the last thirty years in different geographical environment in order to cater to the specific needs of the users. In the United States there has been a proliferation of them. Library networks in other countries are also growing. Several models have emerged that provided specific services. Not all networks conform to the essential functions of library networks. However, the essential functions should include the promotion of Resource Sharing, creation of resource sharing tools like Union Catalogues, rationalisation of acquisition and maintenance of International standards for creation of records uniformly. Libraries should be able to join different types of networks depending upon the need and select a model, which conforms to its requirements. (Kaul, 1999)

In the developed countries resource-sharing networking was started long back. For instance the growth of networks in the United States can be traced from the mid of 1960. USA is the birthplace of library networking and by now libraries in each state is networked to local, regional and national network. It is important to note that the US Department of Education has been advocating a vigorous policy of promoting library networking. It offers networking grants, supports inter-library loan projects, automation and retro-conversion projects, resource sharing schemes, etc. besides providing regular federal grants annually to the public and academic libraries. Resource Sharing works in UK is also well established. The best example is Birmingham Library Co-operative Maintenance Project(BLCMP) in Birmingham, has 13 million bibliographic records of books, serials, music etc. in its database and its catalogues get a hit rate of above 90 per cent with more than 60 libraries comprising public libraries, college libraries, university libraries, national and special libraries. BLCMP has introduced EDI clearing house service in about

25 libraries. In Australia the resource sharing tools have grown from catalogue cards to national databases with the contributions of many older and larger libraries. In Australian Bibliographical Network, the national and central bibliographic databases are maintained and co-ordinated and maintained by a national agency. The Swedish Model for resource sharing is called the Consortium Model. This model is developed only for six major science and technology libraries in Sweden.

The developing countries like India are lagging behind in library co-operation. The reasons for the same are poor funding and the non-existence of the spirit of give and take or exchange is delaying the prospects of resource sharing programmes. The practice of resource sharing in the Republic of China (Taiwan) has been as limited in scale as has been in India. Greater efforts have been made in China for the development of documentary information resources because it was considered that these resources would work as China's knowledge reserve to promote the development of economy, science, technology and culture. The main effort was made on the rational distribution of the resources with the adoption of new technology. In some countries, resource sharing has become an important library programme such as in Thailand. In the 1970's work on the creation of bibliographic tools such as union catalogues and union lists of serials had begun but in the 1990s networking was considered to be the main tools for resource sharing. Best examples are MOSTE (Ministry of Science Technology and Environment) library network and CHULALINET (Kaul, 1999).

The growth of library Networks in India can be traced to the initiatives made by NISSAT in establishing CALIBNET in 1986, DELNET in 1988 and other networks subsequently. University Grants Commission (UGC) established INFLIBNET in 1988. DELNET has emerged as the first operational library network in India with the support of the National Informatics Centre. No efforts have been made to network public libraries since it is becoming essential to provide networked information to the public. The progress of INFLIBNET has not been at the level as it was planned. There has not been much progress made by BONET and CALIBNET as library networks. They have prepared no union catalogues. MALIBNET has also not prepared union catalogue, which is a must for resource sharing. DELNET, on the other hand, has made considerable progress. More than one hundred and sixty six libraries have joined DELNET as an institutional members. The database have increased from one in 1995 to 12 in 1997 with an average increase of about 160 percent in the size of data from 1996 to 1997 and 138 per cent from 1995 to 1996 (Kaul, 1999).

Environmental Information Systems in India

The UN Conference on Environment in 1972, at Stockholm, warned the world about the forthcoming danger in the area of environment and also established the fact that environment and development are two sides of the same coin. The environment has become a global issue. Different disciplines of knowledge are now studying environment and its related issues.

India, a large and old civilisation, has inherited a vast area with a variety of flora and fauna. It is one of the largest reservoirs of bio-diversity, along with other natural resources. To preserve and sustain such precious resources, scholars and missionaries are trying to understand the environment and its related issues. The information generated all over the world is very important for these scholars. There is a need to develop a network using the latest technologies and share the wealth of information.

Various steps have been taken in this direction by the Government of India and by other institutions with the help of World Bank under its Environmental Management and Capacity Building Programme. At the Government level, the Ministry of Environment and Forests of Government of India established Environmental Information Systems (ENVIS) centres across the subcontinent act as communication bridges to reach out to the masses. The basic premise was to empower people through the powerful tool of information by evolving decentralised information paradigms and make them sensitive towards environment (Harjeet Singh, 1999).

ENVIS is a decentralised network consisting of a focal point in the Ministry coordinating the activities of a chain of 25 subject-specific nodes located in various prestigious Institutions/Organisations all over the country. (Harjeet Singh, 1999).

The objectives of ENVIS are classified into two broad categories- long-term and short-term objectives. The long-term objectives of ENVIS are as follows: 1) To build up a repository and dissemination centre in Environmental Science and Engineering; 2) To gear up the modern technologies of acquisition, processing, storage, retrieval and dissemination of environmental information; 3) To support and promote research, development and innovation in environment information technology.

The short-term objectives are as follows: 1) To provide national environmental information service relevant to present needs and capable of development to meet the future needs of the users, originators, processors and disseminators of information; 2) To build up storage, retrieval and dissemination capabilities with the ultimate objectives of disseminating information speedily to the users; 3) To

promote national and international co-operation and liaison for exchange of environment related information; 4) To promote exchange of information amongst the developing countries.

The responsibilities of the ENVIS Centres are as follows: a) Building up a good collection of books, reports and journals in the particular subject area of environment. b) Establishment of linkages with all information sources in the field of environment. c) Responding to users' queries. d) Establishment of a data bank on some selected parameters relating to the subject area. e) Co-ordination with the focal point for supplying relevant, adequate and timely information to the users. f) Helping the focal point in gradually building up an inventory of information material available at the Centres. g) Identification and filling up of the gaps in the specified subject area. H) Bringing out newsletter/publications in their subject area for wide dissemination.

Based on the functions of the ENVIS, it has been designated as a National Focal Point (NFP) and a Regional Service Centre (RSC) of INFOTERRA of UNEP for the South Asia sub-region, a global environmental information network which stimulate and support exchange of information within and between the nations. Almost all member countries of United Nations are partners of this network.

ENVIS maintains a close liaison with various national information systems like National Information System of Science and Technology (NISSAT), Biotechnology Information System (BTIS) and several other similar networks for exchange of environmental information as well as to avoid duplication of efforts in the concerned fields. ENVIS also makes use of a large number of computerised databases developed by scientific institutions all over the country. In order to search the various databases both nationally and internationally, ENVIS has created a Web site, which could be browsed at <http://www.nic.in/envfor/envis>.

ENVIS Focal Point in the Ministry has been identified as an implementing agency for UNDP's Sustainable Development Networking Programme (SDNP). The SDNP has been initiated with financial support from United Nations Development Programme (UNDP) and International Development Research Centre (IDRC), Canada for a period of three years (1998-2001). The goal of the programme is to promote the process of sustainable development through organised accessibility to and exchange of information among all concerned parties, viz. academic and research institutions, NGOs, government bodies and business establishments. The ENVIS Focal Point in the Ministry networks with twenty-five ENVIS Centres located in various parts of the country. These Centres have been collecting, analysing and disseminating information on their specialised subject areas related to environment.

It is important to note that both ENVIS and SDNP have to work together to avoid any duplication of efforts and set up a common goal which can be met by joint efforts of the ENVIS Focal Point in the Ministry and the SDNP Secretariat.

An Information Sharing System in Environmental Economic

In addition to the ENVIS networking, a model for resource sharing is being developed at Environmental Economic Unit of the Institute of Economic Growth (Kaul, Surekha1999). The Ministry of Environment and Forests, Government of India, with financial support from the World Bank, is implementing the India Environment Management Capacity Building Technical Assistance Project. One important component of the programme is environmental economics. Environmental economics as a discipline studies the impact of economic activities on the environment and the implications of using environmental resources in economic activity. Number of issues, like, Pollution, bio-diversity, climatic change, etc. are being examined in different context, space and time by the economists and other social scientists, located all over the world. During the last few years a lot of information and knowledge has been created in the area of environmental economics. In order to understand the complications involved in environmental issues, it becomes imperative to share and disseminate the knowledge among the interested individuals and organisations. Modern Information Technology is helpful for this purpose.

The Expert Committee on Environmental Economics (ECEE) under the Chairmanship of Dr. Raja J. Chelliah is responsible for an effective implementation, monitoring and supervision of this programme. Four core institutions namely (Madras School of Economics (MES), Chennai; Institute of Economic Growth (IEG), Delhi; Indra Gandhi Institute of Development Research (IGIDR), Mumbai and Indian Statistical Institute (ISI), Calcutta and thirteen other interested institutions have been identified for countrywide implementation of the project. MES is the co-ordinating agency for execution of the project.

The Environmental Economics Unit (EEU) is part of the IEG, which was founded on 11 November 1958, by Professor V.K.R.V Rao. Professor Rao, the first director of the Institute. The Unit was set up in 1998, initially to develop capacity building activity on Environmental Economics in India. The Unit undertakes research and training activities, approved by the Academic Committee of the Institute and fitting into the chapter of activities proposed under the World Bank Project Implementation Plan on Capacity Building in Environmental Economics. The areas of research broadly covered under this unit are:

- * Valuation of natural resources, resource accounting and integration

- * Fiscal and other instruments for environmental management
- * Institutional approach to bio-diversity and common property resource management with reflection on gender and other equity issues.

Aims and objectives:

The main aim of the of Environment Economics Unit is to carry out the research work in Environment Economics and its allied areas.

- * To carry out research work in areas of environmental economics and provide policy guideline (e.g. resource economics, pollution abatement policy at local and Global level, Exploitation of Natural Resources, Bio-diversity, thrust for Urbanisation);
- * Dissemination of information (part of the World Bank project) through proper training to academics, practitioners, policy makers in government and non-governmental organisations;
- * Dispatching of material or information through E-mail to interested persons in India and abroad;
- * To introduce environment economics as a core course at university level; and
- * To bring more awareness about environmental economics through the activities listed above.

To carry out these aims and objectives of the EEU, there is a need for proper interaction between different institutions/ organisations at national and local level. This interaction is possible only with the help of resource sharing and Networking. This electronic data interchange, messaging etc. (Networking) can be defined with the help of the model.

The Environmental Economic Unit is at present providing the following services:

a) CD-ROM Search Services: CD-ROM is one of the most important electronic resources available at IEG library keeping in view its importance and utility. It is also providing the CD-ROM literature search services through various CD-ROM databases. Down loading data bases and disseminating the same on various subject, like, Energy Economics, Natural Resource Economics, Air Pollution and Climate changes, etc.

b) Contents Page Services: The Unit has also introduced this service for environmental economics unit group as well as Indian Society for Ecological Economic (INSEE) with the objective of providing access to the contents of Journals received at IEG Library. Potential users of this service have already been identified. The contents of relevant journals are downloaded from the Internet too.

1. Internet service: The Unit is also providing the services of downloading the information through internet access and disseminating the same among all the institutes in India listed for conducting training and research in Environmental Economics by the Baseline Survey, conducted by MSE in 1998.
2. Abstracting and full text Service: The unit is also providing abstracting service as well as full text services on request basis.
3. During the faculty upgradation programme participants are provided with reference material.
4. Visitors are also provided with above-mentioned services.

Since IEG is one among the core institutes, it disseminates information to various institutions and individuals. Institutions include universities, research institutions and college libraries. On the other hand individuals include trainees, researchers and specialists. Information dissemination is a two way process. After collecting queries from different individuals, the main issues relating to Environment are identified and material related to that is disseminated to all interested individuals as well as the institutions working on different environmental issues.

Networking Model

A network can be local, regional, national or international. It is for the electronic transfer of information between two or more points irrespective of distance. The model that is used for networking as well as Resource Sharing in Environmental Economics is given in Figure1. The Network is being developed in stages.

At first stage, the model of Resource Sharing includes the following:

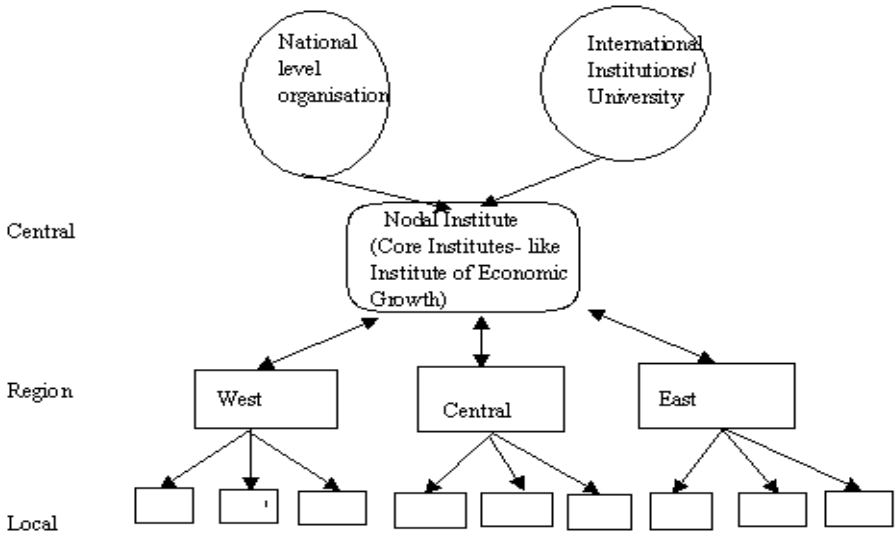
- Inter-linking between National & International Institute/University /Organisation in the field of Environmental studies.
- One of the national level institute is taking initiative(IEG) to act as a hub (a central node) for co-ordinating all networking activities.
- Central node is supposed to get information from the national level institutions as well as international institutes in the field of environmental studies.

At the second stage, the central node accumulates the information from all participating institutions of national and international level and to be disseminated to regional level institutions/universities etc. To make this process of information dissemination more effective and useful, the two-way communication should be encouraged.

At third stage, after the networking among international, national, regional institutions/ university, situated at regional level will disseminate information at

the local level Institutions/ University, which also includes Non-Govt. Organisation.

At present, this network is at the first stage of its operation. To make this network successful there is a need to develop physical and human resources. The nodal library shall take initiative for installing an integrated CD-ROM network system (e.g. Central Library of IIT Madras). Scanners shall also be made available. The human resource shall also be trained to use latest information technology.



All the participant institutes in the network would be motivated and encouraged to provide efficient services to the users. The model has the following features:

- a) Information generated and created any where in the world is disseminated speedily at all levels.
- b) There is no concept of membership fee. Participating institutes and organisations will arrange their own money form different sources.
- c) Institutes/Universities are fully equipped with computers and other related equipment for giving document delivery services.
- d) Each institute is independent.

- e) To make this networking efficient, skilled and experienced human resource is being deployed. The attitude of such people is of critical importance.
- f) Use of electronic form of publication for sharing resources
- g) At a later stage, duplication of costly and highly used Journals may be avoided by some mutual agreement and the same can be shared through the network.
- h) This network is decentralised form of acquisition and storage in building the shared resources. This would be technically valuable and economical also. This model focuses on specific subject; to begin with it is keeping the size of the resources to be shared as small as possible and within manageable limits. It will be economically viable also.

In the next phase, nodal library can also think about the digital libraries. Information may reside on different storage media such as electronics memory or magnetic and optical disk. In order to access digital information it is necessary to use either special purpose, multimedia reader stations or some form of computer system. The information can also be accessed remotely via telephone modems or by means of computer communication networks. This information can be shared at a very low cost. Therefore, while a conventional library might hold one or two copies of a book, a digital library could generate an unlimited number of copies at the touch of a button (Chopra, 1999).

Developing such a network requires a proper co-operation and understanding. The similarities and dissimilarities of the proposed model with other existing model are given in the table 2.

Concluding Observations

It can be concluded that in a developing country like India, steps are being taken to disseminate knowledge about environment. The capacity is being built up with the help of international funding agencies for this purpose. With the explosion of knowledge and constraints on the financial resources, the resource sharing networking has emerged as an important alternative. The information technology has facilitated the resource sharing among the institutions located in different geographical areas. It enables the participating libraries to obtain material from each others may be the list of books, indexes and abstracts of required articles, facsimile copies of required pages or documents, charts, figures, graphs, drawings by using computer terminals attached to a large or very large network system and data bases coupled with visual display units (VDUs) and attached with printing facility. Information can be scanned first on the screen, and if required, relevant information can be obtained in the print form.

Table 2: Similarities and Dissimilarities of Resource Sharing Models

Existing Model	Proposed Model of Resource Sharing	
	Similarities	Dissimilarities
1. Centralized Collection, Development and Service	1.1 Services are at National and Regional level 1.2 Participant institute can contribute towards funds	1.1 Every institution is independent. Governing body may comprise representative from International, National, Regional and local level Institution.
2. Centralized Collection, Development and Service by Subject	2.1 State level funding 2.2 Developing a shared collection of documentary resources on specific subjects	2.1 No geographical limitations 2.2 No membership fee to be imposed Every institute is independent but they should help in co-ordinate acquisitions
3. Centralized Collection, Development and Service at Organisation level	3.1 Participant institutions can contribute funds	3.1 Every unit is independent 3.2 No geographical limitations
4. Coordinated Collection, Development at Institutions level	4.1 Co-ordinate the acquisition to eliminate duplication 4.2 Decentralized system of services	4.1 No geographical limitation 4.2 Users library need not to pay

The network in the Ecological and Environmental Economic Studies established in India, though at the first stage of operation, will overcome the geographical barriers. Initial problem of funds to purchase computers and other related equipment has been solved with the help of the World Bank, and Government funding. Later on, to sustain such a system participating institutions will be dependent on their respective institutions for funds or they will have to generate resources. It is important that the attitude of the employee of the participating institutes should be very co-operative. In addition to learning about the technical aspect of information technology and its uses in the resource sharing, there is a need to make an effort for the attitudinal change among the Human Resources in the libraries. The training programme related to the development of Human Resource in the library and information centre should be devised keeping in view this aspect. One of the positive features of the network, for the Ecological and Environment Studies is that it can be developed in stages. As more and more

institutes are willing to be the part of the network, they can be included in this. This network will help in furthering the knowledge in the area of environment.

Resource Sharing networks in the developing countries face problems of financial resources. In developed countries there is no such problem. In developed countries, Government is taking active interest in promoting such networks. However, in developing countries, Government is not showing much interest. In India, there is a problem of financial resources. However, there is no dearth of skilled human resources to manage such networks.

The study has got certain implications for all the developing countries. Library networks can be established for co-operation and resource sharing among libraries of all types covering all subjects in a city, state, region, or a country. Specialised library networks among one type of libraries or among the libraries in one discipline may also be established. Necessary databases and bibliographic tools like union catalogues and union lists be created. Rationalisation of acquisitions should be done primarily in libraries specialising in one discipline. Network should be engaged with efficient ILL and document delivery services. Network should aim at developing online access among member-libraries to each other's specialised collections and services either through network or directly. All libraries should follow a standard MARC format, ACCR-II cataloguing code, a standard thesaurus like LCSH uniformly. E-mail and Internet facilities should be available with the libraries. Library network should offer shared cataloguing, co-operative collection development, reference service, training, etc. A network model should be selected keeping in mind the purpose for which the sharing is to be done by the participating libraries. The networks that offer services on all subjects and serve all types of users and libraries will progress, as they will attract a large number of users that will make them sustain their services (Kaul, 1999).

A number of networks are operating in India. However, no study is available to measure the effectiveness of the existing networks. There is a need to investigate the problem faced by these Networks. The result of the study will help in improving the other Networks. This is an area, which need systematic and continuous research.

Notes

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NEED FOR INTERNATIONAL COOPERATION TO MEET INFORMATION REQUIREMENTS OF SCIENTISTS IN A DEVELOPING COUNTRY*

By Alladi Vagiswari, S. Amba, Christina Louis

Introduction

Scientific and technological revolution in communication has led to globalisation of science. Internet and electronic communication now play an integral part of all scientific endeavors. No doubt there was close interaction among scientists working all over the world, through letters, journals and telephones even before the advent of the electronic communication. But none of the communication media has had such a dramatic effect as the introduction of the Internet. In view of this technological change, it is necessary that librarians working in special libraries acquire new skills if they have to work in the new environment. Cooperation and coordination will be the bedrock for library activities of the millennium. These two C's confined hitherto to certain traditional activities in the library has now extended to most areas in the library and to other players in the Information Arena as well as such as the Publishers and Vendors. Both librarians and publishers/vendors have to develop symbiotic relationships to prosper. Thus networking and consortia formation, a result of the 2C's will play a prominent role in library and information activities. In this paper we have discussed the role of librarians in special libraries in developing countries like India in relation to the above two activities networking and consortia formation and the need to work towards international cooperation.

Information Access: Indian Scene

Funds for scientific research is very limited and in a developing country like India, it is even more so. In the year 1996-97 0.66% GNP was devoted to research and development activity which is lower than the previous years. This is a very small proportion when compared to developed countries like UK, US and Japan where more than 2% is allotted to research (DST,1999). Batten (2000) has shown that in

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the case of grants for astronomy there is a shocking disparity in per capita expenditure in terms of GNP from the worlds richest to the world's poorest countries. The disparity is considerably more than a factor 100. Though Batten talks of Astronomy it can be said that this is true of science taken as a whole. India's per capita expenditure was only \$2.48 during 1996-97, which shows that very little can be achieved with this grant. These are the figures for scientific activity taken as a whole and it is difficult to estimate from this how much is spent on libraries and in acquiring scientific information. One can, however, safely surmise that it is negligible.

It should also be mentioned here that in India there is a wide gap between the facilities available in government funded research institutes and the universities. UGC supports research and development in the universities but this is very meager. India after independence followed a policy of funding newly created research institutions, may be with a view to improve her visibility in the world scientific community, but neglected research in universities thus creating the necessity for the researchers in the universities to depend on the Research institutions. Due to lack of sufficient funds the universities remained mostly teaching institutions and did very little research. After a few decades, government did recognise this draw back and to extend support to scientific research in the universities created inter-university Centre like the Inter-university centre for Astronomy and Astrophysics.

There are two ways of providing better information facilities for the scientists. One is to persuade the government to increase the allocation of funds for research activity and other is to use efficiently the existing resources available. In this paper the emphasis will be on the efficient and effective use of the available resources, as persuading the Government to increase its budget is way beyond the scope of librarians alone. It is in the context of the efficient use of available resources that the role of science libraries and specially, its trained staff has become very crucial.

Today in India there are 200 universities about 400 National Laboratories and 1300 in house R & D units of industries. India is becoming Internationally Competitive, so there is need for infrastructure development. There are 80 thousand scientists employed in these institutions and industry who have qualifications at the post graduate level and above and are actively involved in research work and these scientists need information. Special librarians and libraries under Science and Technology group are in a much better position than libraries attached to the universities. Many special libraries have access to computers, CD-ROM databases and telecommunication facilities such as e-mail and Internet access. These special libraries are attached to various scientific institutions such as

the CSIR Laboratories, Defence Research and Development Organisation, Indian Council for Agricultural Research, Indian Council for Medical Research, Department of Atomic Energy, Indian Space Research Organisation, Indian Institutes of Technology, Indian Institute of Science, Indian National Science Academy and Department of Science and Technology. (DST, 1999).

Government Policy

Government of India recognized the importance of access to information and has stated in the 9th plan document "Communication features are needed for the vast majority of our research and teaching community to escape from intellectual isolation. Information technology needs to be deployed appropriately to ensure greater dissemination of knowledge in various fields of science. This can be achieved through internet connectivity with broad band channels for multi-media facility, networking of libraries and computers etc. This will be a major information resource not only for basic research in science and engineering but in all academic fields including health, medicine, and humanities. It must be done in a well-coordinated manner. (9th Five-year Plan, 2000)

The Working Group of the Planning Commission on Libraries and Informatics for the Ninth Five-Year Plan 1997-2002 made important recommendations for the networking of libraries. Librarians attached to special libraries have been playing an important role in providing information to scientists at his place of work. Globalisation of Information Communication has removed all geographical barriers and has enhanced the opportunities for access to vast amount of information. There is a need for the librarians to develop new skills which will benefit the scientific community. "For the information professional the question must be how to unlearn and relearn-how to maintain a valid role in the provision of information at a time when developments in technology have brought the power of information searching to the non-specialist. The answer must be that the information professional develop additional value-added skills".(Marfleet & Kelly, 1999)

We discuss below a few areas in which librarians will have to play an active role.

1. Formation of local, regional and International networks for better cooperation.
2. Formation of Consortia of libraries to share information access and cost.
3. Adoption of Twinning programmes between libraries/librarians of developed countries and developing countries; between librarians of developing countries and among the librarians within the same country.

4. Involving International organisations to provide essential infrastructure and training of information professional.

Networking for Better Cooperation

A library network is a cooperative arrangement between several libraries for the sharing of resources and services. This resource sharing is an important aspect for libraries in developing countries. In India, there are already networks like INFLIBNET, NICNET, INDONET, SIRNET and Regional networks like DELNET, CALIBNET etc. effectively functioning towards sharing the resources and services among many libraries. The establishment of these specialised and multi-type networks at state and national levels is essential and they require support from the government and national agencies. These networks should aim to demonstrate how the members of the networks can get equal access to information in many forms. INFLIBNET, the Information and Library Network of the University Grants Commission was set up to cater to the information requirements of the universities and their research scholars. It also promotes the addition of "value-added skills" to the University librarians by conducting courses and organizing seminars such as the CALIBER, the Convention on Automation of Libraries, Education and Research Institutions. It is involved in the retrospective conversion of records available in the various universities. The various functions of this network can be accessed from URL: <http://www.inflibnet.ac.in/function.htm>.

This network functions as a model network for the other national and specialised networks in the country. With the limited budgetary allocation in the universities, being part of the INFLIBNET is a worthwhile investment for the libraries and information centers.

Realizing the importance of networks in information sharing and transfer, networks are being set up on the basis of geographical location also. In Chennai (Madras) there is a concentration of research and academic institutions in one location. This location has been designated as a Science City. The libraries of the institutions in the Science City irrespective of their size have formed a network to share resources and facilities. To spread the message of networking in India, the DELNET (Delhi library network) organizes the National Convention on Library and Information Networking (NACLIN) regularly at various places. FORSA (Forum for Resource Sharing in Astronomy & Astrophysics) is another informal network of eight Astronomy libraries in India. The members belonging to this network have been sharing their library resources and services for the last twelve years. Recently, the computerised bibliographical catalog of these libraries have

been merged to have a union catalog, with the respective location of the availability of the documents.

Traditionally, Resource sharing meant, the exchange of documents, cooperative acquisitions, shared storage and shared training programs. In recent times it has expanded to the sharing of resources electronically and has also meant the carrying out of the traditional activities in an electronic environment. (Jimba, 1999). In India, there is a great potential in the form of human resources who are IT savvy, an important component in any communication structure. A well-planned strategy to tap this potential for the use of library networks has to be designed by the government agencies. Training programs for the library personnel to handle the hi-tech libraries should be designed in close collaboration with the help of the IT experts. Collaboration, cooperation and coordination between library and IT personnel are essential for the proper and effective management of library and information centers.

International cooperation & coordination can also be a solution which will mitigate the problem of large investment in materials by libraries in India. An illustration of international cooperation would be the PAM-APF (Physics, Astronomy, Mathematics - Asia/Pacific Forum). It is a recently formed regional network, a collaborative effort from the PAM division of Special Libraries Association (SLA) and the Asia Pacific Interest Group (APSIG) of the Australian Library and Information Association (ALIA). This acts as a forum for the sharing and exchange of information resources and knowledge and has participants from 23 countries. (Corbin et al. 2000). A website of this regional forum has been established at <http://msowww.anu.edu.au/library/pam-apf/intro.html>

From India, only a few special libraries have currently joined this regional network as members. It will be more beneficial to university libraries to participate in this forum, which will give an international exposure and exchange of resources and knowledge for the information professionals in our country.

Library Consortium

Library consortia is a collective activity, which is a spontaneous phenomena for any group of libraries in any country. For libraries, consortia provide shared expertise, access to new electronic and print resources, professional development and new sources of funds. In India, the consortia concept is still in the nascent stage. When networking of the libraries came into existence, few years back, there was a reserved approach from the information professionals to extend their total cooperation in India. Now after experiencing the benefits of the networking in recent times, there is now a decided move to exploit the advantages of consortia

also. We should prepare ourselves for such a move immediately by analysing and finding answers to the following questions;

- a. Is there an ideal model for library consortia? Can we identify any successful practices which can be followed for libraries in India.
- b. What is the role of the government in facilitating the establishment of any consortium?
- c. How large can the consortia be and still be effective?
- d. How can member libraries minimize the time and cost, while maximizing the benefits of collective action?

The consortia models currently available are those developed by the developed countries. To answer the questions raised above libraries in India will have to develop their own models. The CSIR libraries are proposing formation of consortia, so also the libraries belonging to the Science City Network. Initially, we have to spell out the purpose for which a consortium is established and also the commitment from every member of the consortium. Since, we do not have any established working library consortia right now, we need to consult or involve government agencies to form some guidelines. This will offer a level of confidence for our libraries to bargain for better services from the publishers/vendors.

As far as the size and complexion of the consortia is concerned, there is a unique challenge which we face in India. Since there is already a disparity in the availability of funds, between various organisation, it is difficult to form a single group with similar facilities available in libraries. A suggestion would be that the universities network already existing might take the initiative in converting their network into a consortia. This will be a worthwhile attempt since most of the members will have similar interests and resources. Special libraries can design their own consortia, depending on their needs and geographical location as is being proposed for the Science City.

A similar move has been started in Bangalore to form a consortium of special libraries group consisting of 15 members. The primary aim of this consortium is to share the access to electronic journals, their license and the cost. These days, virtually all consortia share their license to electronic resources, but many also offer a wide range of other services such as shared catalogs, interlibrary lending, digitizing, preservation etc. A very important aspect of the commitment is the cost involved in any successful consortia functioning. Though every member of a consortium stand to gain equal access to information for what they pay and several accesses to much more information, we need to be more practical and also jointly

bargain for a different pricing structure from the publishers/vendors. (Louis & Vagiswari, 1999). In addition, the members of consortia have to prepare themselves to overcome the infrastructure challenges, in the form of acquiring the basic knowledge of Information technology and also enhancing their communication with their international colleagues.

Twinning Programme

For better cooperation between libraries at the International level twinning programme appears to be a very fruitful proposal. According to UNESCO Guidelines 1994 Twinning is defined as "The ongoing relationship between two libraries in different countries for the purpose of improving the practice of librarianship boundaries. The Twinning relationship should have mutual but not necessarily equal benefits to both libraries. Kesselman (1999) has written an interesting and detailed paper on International Partnership for Science Technology libraries.

Twinning program will help the resource-poor-library to be in constant touch with resource-rich-library to become aware of the new technologies useful to the library with reference to connection to expensive databases, access to current information and other facilities will be possible through this partnership. It will give an opportunity to the librarians to plan the sort of skills that they should develop to provide good service to both the partners. To enter into an agreement the goals should be specified as well as the financial implications and the time frame. By this it becomes clear what is expected of each library. This would be beneficial only if the partners have their institutional support, so it is necessary to formalise the partnership. IFLA has developed an international database, which acts as a mediator for libraries looking for a potential twinning partner. This programme has been developed by IFLA known as Universal Availability of Publications funded by UNESCO PGI programme. (IFLA, 2000). This is the first time a focal point has been established where libraries can turn to while looking for partners. The twinning program need not necessarily be between the developed and developing countries. It can also be between developing and developed countries. There are areas of specialization and endeavour wherein the information flow might have to be more from developing to the developed. This might especially be so in the areas of population studies, epidemiology of tropical diseases etc.

International Assistance for Training and Infrastructure

It is already well known that international collaboration has had a very profound impact on Indian science. There have been many avenues for exchange of

information, such as funding visits of scientists to international meetings and training programmes in well known laboratories.(ICSU) International council for scientific Unions has played an active role in such exchange programmes. Now known as International Council for Science (ICS) has a large number of adhering bodies (about 25)and has helped many developing countries. (Vijayan, 2000). In case of India the Third World Academy of Sciences has also played an important role in helping scientists to visit International Centre for Theoretical Physics, located in Trieste. In addition to this, there are several fellowship programmes for scientists in India, like the Humbolt fellowship, Fulbright fellowship, Commonwealth fellowship etc. Though collaboration and exchange programmes are many for scientists it is not the case with library and information professionals. There are a few fellowships for librarians like the Fulbright programme and the Commonwealth fellowship, which help one or two librarians working in special libraries. If librarians have to function effectively then there is a need for more international training programmes and also international assistance for visits and travel. PAM-APF has established PAM International Membership Award (PAM IMA) and the PAM International Travel Award (PAM ITA). The first Award provides two years membership to Special Library Association, for the librarians from the developing countries. The PAM Travel Award is sponsored by the Geelong East Rotary club (Australia), which partially funds the PAM IMA winner to attend the SLA Annual conference in the USA. (Corbin et al., 2000). These Awards are for the special librarians working in the libraries where Physics, Astronomy and Mathematics are in focus disciplines. In the case of University libraries and the librarians are concerned, we (AV and CL) have contacted ICTP (Trieste) for helping the libraries to establish infrastructure, in the form of PCs and Internet connection. These are mainly required in the university libraries where ever basic facilities are not available. Also assistance can be extended towards the travel for the library staff to attend any national or international library conferences. Special libraries can act as coordinators between international organisations and the beneficiaries to over see that the funds are utilized properly.

Conclusion

Though libraries and information centers attached to scientific research organisations are reasonably equipped to cater to the information requirements of our scientists, the library staff need to have more specialized training in the new information technology environment. But, this is not the situation in the libraries attached to the universities. They not only need specialized training for their library staff but also a suitable communication infrastructure in addition to building up their resources.

In this paper we are mainly looking towards international sources for funds for infrastructure and communication facilities. But we are also thinking of looking towards our private sector in the country especially the IT industry which has enormous potential to help the government organisations. One major proposal mentioned in the 9th plan document is to achieve the level of 2% of GNP, through the industry. This should be made to come forward in a big way by putting demands in the existing R & D infrastructure and by supporting innovative programmes for technology development and refinement.

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BUILDING CAPACITIES - RESOURCE SHARING IN INDIA A CASE STUDY OF THE INSTITUTE OF ECONOMIC GROWTH LIBRARY*

By P.K. Jain

Resource sharing becomes more important and inevitable for developing countries like India, where the information centres/ libraries are short of funds and resources. Further libraries find the space problem for storing purposes and hence they think about library networks and resource sharing. Resource sharing from its elementary concept of inter-library lending, now includes cooperative acquisition, collection development, shared cataloguing, centralised processing, exchange of content page of journals, sharing of bibliographical data, centralised periodicals collection, exchange of electronic documents and articles, obtaining photocopies of articles etc. In India, in the past two decades, information technology has made significant progress. The current state of information handling is indeed sufficient to support and encourage the sharing resources among libraries. Especially, the present decade has witnessed renewed interest in library cooperation for mutual benefits, at the national and international levels.

1. Institute of Economic Growth

The Institute of Economic Growth (IEG) was founded in 1958 by the late Professor V.K.R.V. Rao. The Institute is an autonomous, multi-disciplinary centre for advanced research and training in economics, agricultural economics, health, demography, and sociology and is a recognised institutions of the University of Delhi. IEG's regular faculty consists of about 34 eminent social scientists.

2. Library

The IEG Library also established in 1958 constitutes one of the richest collections of books, journals and reports etc. in the field of social sciences and development problems in the whole of Asia. The primary aim is to build up a useful collection of relevant documents for meeting the research needs and to develop a system for

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information dissemination. Effective service to its readers is the ultimate aim of this library.

2.1 Library Collection

2.1.1 Books

At present the total collection of the library is 1,20,000 documents including books, monographs, workshop papers, proceedings of conferences, statistical serials. An equal number of Micro Documents comprising of Institutional Research Reports, Discussion, Occasional and Working Papers are also available. The library also has a wide collection of Annual Reports of Companies, Dept. of Central & State Government and other corporate bodies. The library holds a depository status for receiving publications of World Bank, United Nations and its allied agencies and other international organisations.

2.1.2 Journals

In addition to the 20,000 back volumes of journals, the library subscribes to 126 current journals, receives 52 journals in exchange and 126 current journals on as gratis. The library exchanges the Institute's research output and publications (including its journal, (Contributions to Indian Sociology) with similar institutions in India and abroad. In total, the library receives 304 journals.

2.1.3 Subject Coverage

IEG Library has documents and journals in the field of economics, economic development, energy, environment, finance, econometrics, mathematics, agriculture, forestry, industry, irrigation, sociology, social anthropology, gender, demography, health etc.

2.3 Library Automation

2.3.1 Software

Library automation has started in 1993. Now IEG Library is now fully Computerised and uses CDS/ISIS (UNESCO) library software for recording the incoming documents and retrieving the bibliographical information from the same database.

2.3.2 Hardware

At present, library has nine Computer Nodes including four nodes with Internet connectivity and CD-ROM Drive, one printer and one Laser Printer. All the nine nodes are connected with LAN. Faculty and researchers can access library databases

from any nodes at their desk connected to network. It has got a photocopier also which is used to reproduce the documents on request.

2.3.3 Databases

IEG Library has the following databases for recording the different kinds of documents.

1. BOOKS	- for Books	50,000 records
2. IELJR	- for Journals	2,000 records
3. IELMR	- for Serials	3,200 records
4. MD	- for Micro-Documents	1,000 records
5. AR	- for Annual Reports	800 records
6. APPBKS	- for Current Arrivals	8,000 records
7. CD	- for CD-ROMs	20 records

2.3.4 CD-ROMs

The Library has 4 computers with CD Drive and 20 CD-ROMs including Econlit, Popline, World Development Report, World Development Indicator, World Development Sources, TEDDY Online, Trade Policy Review etc.

2.4 Reference and Information Services

2.4.1 Online Information Retrieval and Dissemination of Information

Library has an well-organised reference section, which is equipped with latest reference books to provide ready reference and long range reference to its users. Generally reference queries are received through personal contact, telephonically and through E-mail. Library has E-mailing facility and provides various reference and documentation services more quickly to its readers through E-mail.

1. To receive reference queries either from faculty or from the outside. (India & abroad).
2. To provide reference & documentation services more easily (e.g. providing information through E-mail regarding Arrival this Week).
3. To facilitate Inter Library Loan conveniently.
4. To mail reminders for overdue books.

Library also provides following services through Internet and CD-ROM

1. Contents of journals available on different sites.

2. Latest Publications available on the Internet.
3. Journals abstract and articles.
4. Full text service
5. Bibliographic service
6. Working papers available on Internet.

2.4.2 Selective Dissemination of Information

Library provides SDI services to its users which includes:

1. Finding out the subject interest or information needs of the users and subject contents of the in-coming documents.
2. Connecting a right user with the right document through matching and notification.
3. Keeping the interest file of the users up-to-date and responsive to their needs on the basis of the feedback.

2.4.3 Current Awareness Service (Arrivals this week)

Library also provides CAS to keep seekers of information abreast with the latest developments in their responsive field. CAS includes the '**Arrivals This Week**' document which is E-mailed to all the Faculty members, scholars and researchers on every Friday. It includes all the in-coming documents such as books, journals, annual reports, micro- documents, Working Papers and serials etc. Information available on various Newspapers is also disseminated regularly. New books, periodicals, micro-documents etc. are displayed regularly in the library.

2.4.4 Bibliographic Service

Bibliographic service provided by IEG Library play an important role in helping the research scholars to complete the research work in time. It also provides short bibliographies on request to research scholars, IEG staff and institutions all over the India. Library also prepares Subject Bibliographies on request basis.

2.4.5 Networking/Inter Library Loan Service

Today no library is self sufficient to fulfil its users information needs, therefore arrangement is made to help the readers in getting the desired books and journals which are not available in the IEG Library on inter-library-loan basis from other libraries and research institutions in the country. Library has its networking with different libraries e.g. Rattan Tata Library, Delhi School of Economics, Delhi University Library System, NCAER Library, IIPA Library, NIPFP Library, DELNET and other reputed libraries in Delhi.

IEG Library is also a member of DELNET (Delhi Library Network), which gives access to several online databases of the different libraries such as Union catalogue of books, Union list of current periodicals in Delhi libraries, Union catalogue of periodicals in Delhi libraries, Database of periodicals articles, Books in print: New titles from Indian publishers and ILL online.

2.5 Future Plan

IEG Library's future plan is to upgrade its hardware and software resources in its near future to enhance the facilities to the readers and increase the productivity of the staff members. Library's plans are:

1. To purchase a CD-ROM Server/Juke Box for use of CD's Online.
2. To subscribe "JSTORE" an electronic storage of journals. It would help to the Faculty and Researches in their research work.
3. To upgrade its current Software CDS/ISIS to Window-based Software either WINISIS or some other Software which would be easier for users and the library staff for better and faster service.
4. Bar Coding of documents so that the charging and discharging of documents may be faster.

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IMPLEMENTING WWWISIS FOR PROVIDING WEB ACCESS TO BIBLIOGRAPHIC DATABASES*

By Francis Jayakanth

Abstract: CDS/ISIS, an advanced non-numerical information storage and retrieval software was developed by UNESCO. With the emergence of WWW technology, most of the information activities are becoming Web-centric. Libraries and information providers are taking advantage of these Internet developments to provide access to their resources/information on the Web.

A number of tools are now available for publishing CDS/ISIS databases on the Internet. One such tool is the WWWISIS Web gateway software, developed by BIREME, Brazil.

This paper illustrates porting of sample records from a bibliographic database into CDS/ISIS, and then publishing this database on the Internet using WWWISIS.

Keywords: CDS/ISIS, WWWISIS, Web Access

Introduction

With the emergence of the Internet, the global connectivity of computer systems and access to electronic information have become a reality. The Internet has progressed magnificently to provide many user-friendly tools like Gopher, WAIS, E-mail, Telnet, FTP and World Wide Web (WWW) for information processing and access. The WWW, which is integrating all other access tools also provides a very convenient means for publishing and accessing multimedia, hypertext-linked documents stored in computers spread across the world. With the emergence of WWW technology, most of the information activities are becoming web-centric. Once the information is on the Web, one can access the information from any part of the world. Also, a web browser like Netscape or Internet Explorer would be used as a common user interface for accessing information/database. Libraries and information providers are taking advantage of these Internet developments to provide access to their resources/information on the Web.

CDS/ISIS is a menu driven generalized information storage and retrieval system. It allows you to build and manage structured non-numerical databases i.e. databases whose major constituent is text. The search language of CDS/ISIS is based on

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Boolean algebra, which provides a convenient way of expressing logical operations between database fields

A number of tools are now available for making CDS/ISIS database accessible on the Internet/web. Some of these tools are 1) the WAIS-ISIS Server. 2) the WWWISIS Server 3) the IQUERY Server.

This paper explains porting of sample records from a bibliographic database into a CDS/ISIS database & then publish this CDS/ISIS database on the Web using the freely available CDS/ISIS Web gateway software called WWWISIS developed by BIREME, Brazil. WWWISIS versions for several operating system (OS) platforms are available I have used PC-Windows edition of WWWISIS 3.2c with Windows'95 and OMNIHTTPd Web Server software.

About CDS/ISIS

CDS/ISIS, an advanced non-numerical information storage and retrieval software is developed and maintained by UNESCO. It was developed to satisfy the need expressed by many institutions, especially in the developing countries, to streamline their information processing activities by using modern (and relatively inexpensive) technologies. The software was originally based on the mainframe version of CDS/ISIS. At present, UNESCO maintains three fully compatible versions of the software for different hardware/software platforms – MS-DOS, Windows & Unix.

The major features of the CDS/ISIS software are:

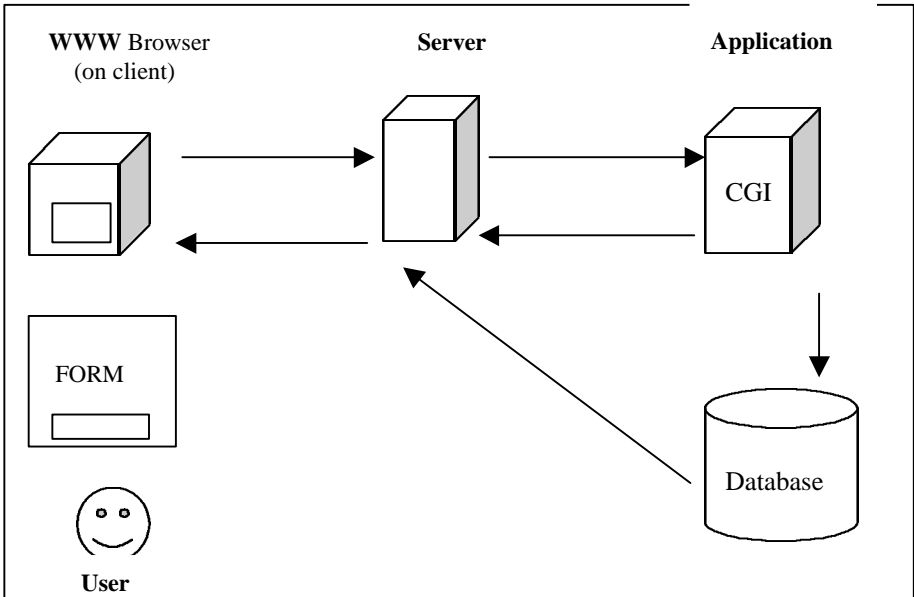
- the handling of **variable length** records, fields and **sub fields**, thus saving disk space and making it possible to store greater amounts of information;
- the handling of **repeatable fields**;
- a **database definition** component allowing the user to define the data to be processed for a particular application;
- a **data entry** component for entering and modifying data through user-created data base specific worksheets;
- an information retrieval component using a powerful **search language** providing for field-level and proximity search operators, in addition to the traditional and/or/not operators, as well as **free-text searching**;
- a powerful **sort and report** generation facility allowing the user to easily create any desired printed products, such as catalogues, indexes, directories, etc.;

- a data **interchange** function based on the **ISO 2709** International Standard used by leading data base producers;
- an integrated application **programming language** (*CDS/ISIS Pascal* and the *ISIS_DLL*), allowing the user to tailor the software to specific needs;
- functions allowing the user to build pseudo-relational databases.

Database Access on the WEB

The World Wide Web (WWW) is a client-server distributed hypermedia system initially developed at the European Laboratory for Particle Physics (CERN) in Switzerland, where it was envisaged as a means for sharing information amongst physicists. The process of providing Web access to database involves the interaction of Web server, Web browser, CGI scripts/programs and HTML forms. The use of HTML forms on the client side and CGI applications on the server side comprises the key mechanism to collect search requests and/or data entry and submit it to the database. Figure 1 depicts this mechanism.

Figure 1: Client/server interaction.



WEB Server

Web server is a computer system that provides Web services and Web pages to Intranet or Internet users. A HTTP (Hypertext Transmission Protocol) daemon program should be running on the web server to listen and respond to client's requests. A daemon is a process that runs in the background waiting for a client request. When the request is received, it processes it and then keeps waiting for other requests. A web server usually has a dedicated connection to the Internet/Intranet. Web server software is available for different OS platforms. The best way to access WWW is by using GUI based client programs like Netscape, Internet Explorer or Mosaic. These client programs are called web browsers. The GUI based browsers can interpret image and audio files too.

WEB Server and WEB Browser Interaction

A Web browser acts as an interface between a user and the Web server. Web browsers work by connecting over the Internet to the web servers, requesting specific documents and then formatting the documents they receive, for viewing on the local system. The Web pages on a Web server are text files encoded with HTML tags. These documents are usually named with the suffix "html" and are interpreted by the Web browsers that receive them. If you click the Open button on your browser and type any URL (eg:<http://www.ncsi.iisc.ernet.in/>), the browser generates a GET request, connects to the server at the specified URL and waits for a response. The server returns a response and closes the connection. This is the basic browser and server interaction.

Common Gateway Interface (CGI)

CGI is an essential tool for creating and managing interactive Web sites.. A Web server program with CGI support can invoke an application program, pass user-specific data to the program. The application program then processes the data received from the browser and the server then passes the program's response back to the Web browser. CGI is not a programming language in itself, but is a mechanism by which Web browsers interact with programs residing on the Web servers. Web servers use a special directory, commonly named **cgi-bin** to store CGI programs/scripts.

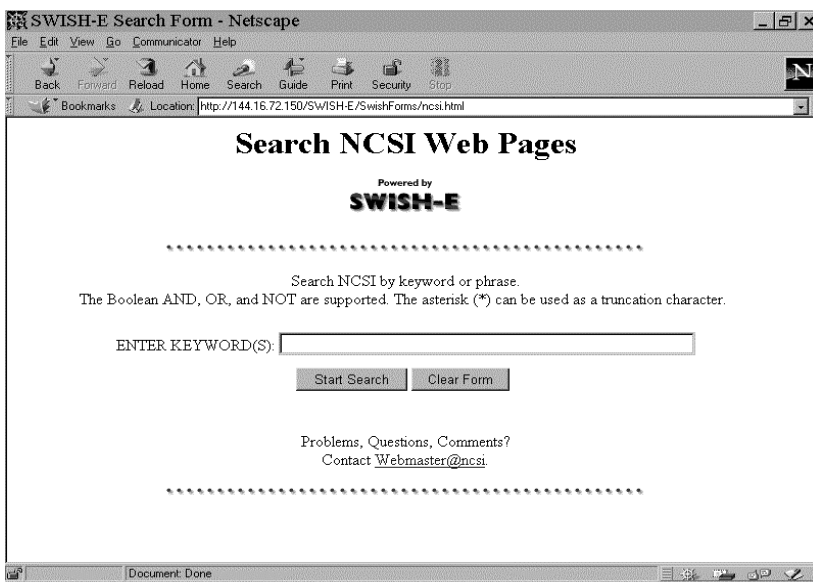
The Web server knows that the files stored in the cgi-bin directory are to be executed rather than simply sending it to the Web browser for display. CGI programs can be written in a variety of programming/scripting languages like MS-DOS batch file, Unix shell scripts, Perl scripts or higher level programming languages like BASIC , C or C++ etc.

HTML Forms

Forms are part of HTML that allows a user to supply information. Forms are used to accept inputs from a user. A simple form is shown in figure 2.

- This sample form has one **Text input field**: for entering keywords.
- The form also has a **submit button**. The user can click this button after filling the form. CGI program will act upon the information contained in a form only when the form data has been submitted to the CGI program. Clicking on the form's **Clear Form** button **resets** the form back to its default values.
- The form can also have **Multiple-choice fields** enabling users to select a specific item or items from a list.

Figure 2: A Sample HTML form.



The screenshot shows a Netscape browser window with the title "SWISH-E Search Form - Netscape". The address bar displays "http://144.16.72.150/SWISH-E/SwishForms/ncsi.html". The main content area features the heading "Search NCSI Web Pages" and "Powered by SWISH-E". Below this, there is a search instruction: "Search NCSI by keyword or phrase. The Boolean AND, OR, and NOT are supported. The asterisk (*) can be used as a truncation character." A text input field is labeled "ENTER KEYWORD(S):". Below the input field are two buttons: "Start Search" and "Clear Form". At the bottom, there is a link for "Problems, Questions, Comments?" and a contact email "Webmaster@ncsi".

WEB Interface to CDS/ISIS Databases

Following are some of the tools, which facilitate in providing Web access to CDS/ISIS databases.

- **WWWISIS** is one of the most popular softwares, which acts as a server for CDS/ISIS databases in a WWW environment. It was developed by BIREME and PAHO and is freely available on the Brazilian archive host; <ftp://ftp.brme.bireme.br/wwwisis> or <http://www.bireme.br/wwwisis2.htm> WWWISIS documentation is available at <http://www.bireme.br/wwwisis1.htm>. Searching, formatting and field updating languages of CDS/ISIS are supported by WWWISIS. WWWISIS is available for different O/S platforms like Windows'95, Linux, Sun Solaris etc. There are number of sites which are making use of WWWISIS to provide web access to their CDS/ISIS databases. The Middlesex University in UK (<http://158.98.53.13/>) is an excellent example usage site for WWWISIS.
- **IQUERY** is commercial software designed by Alejandro Ferreira Guido of Uruguay, to run under three platforms, Linux, SCO and DOS. The system was designed to act as an interactive search engine for Mini/Micro CDS/ISIS databases, it was developed taking the directives showed in the ISIS 3.0 version. The software can run in three different modes, as an interactive command shell, as a CGI to run under WWW servers, and as an interpreter taking the statements from a file. <http://www.gti.net/reu/iquery/>
- **WAISIS** freeware server distributed at the ftp site of GARR in Italy. <ftp://ftp.nic.it/pub/WAIS/WAIS-ISIS/>
- **Websis**, a CGI application written in C to search CDS/ISIS databases over the Internet using a Web interface. Websis was developed by the Infocentre and is distributed free of cost. <http://www.theinfocentre.com/>
- **JAVASIS** 3.0 consists of two Java applications: a Java Client and a Java Server. It is available for Windows 9'x and NT, Linux and other OS platforms. <http://web.tiscalinet.it/javaisis>

WWWISIS and its Operations

WWWISIS is a system specially designed to act as a server for CDS/ISIS databases in Intranet or Internet World Wide Web client server environment. It was developed and is being maintained and distributed by BIREME, the Latin America and Caribbean center on Health Sciences Information in Brazil. The current version of WWWISIS is version 3.3. It provides functions for searching, formatting and data entry operations over CDS/ISIS databases. It operates as a

CDS/ISIS server through the WWW Common Gateway Interface (CGI). The actual operation is driven by parameters.

Features of WWWISIS

- A key feature of this package is its capability to dynamically generate execution parameters, based on data sent to the CGI process from the WWW browser.
- WWWISIS may be called directly from the command prompt or as a command line inside a CGI script. An example of direct call to `wwwisis` in the command prompt:

```
wwwisis db=ccodw bool="plants and soil" pft=v200/
```

Here WWWISIS is called with three mandatory parameters, namely *db*, *bool* and *pft*. With the *db* parameter, name of the database (`ccodw`) is passed. With the *bool* parameter, the search expression ("plant and soil") is passed. With *.pft* parameter, the fields that are to be displayed from the retrieved record/s are included

- CDS/ISIS searching, formatting and field updating languages are supported by WWWISIS.
- Search expressions can be gathered through HTML forms, passed via CGI to WWWISIS and the results formatted and delivered to the client.
- WWWISIS output to the browser is generated via CDS/ISIS formatting language.
- WWWISIS uses CISIS interface library developed by BIREME to support CDS/ISIS searching, formatting and field updating features.
- No installation procedure is involved. When used as a Web gateway for CDS/ISIS databases, it should just be copied to the `cgi-bin` directory configured for the Web server.

Interfacing CDS/ISIS Database with WWWISIS

WWWISIS is freely available for different OS platforms. For the work reported in this paper, I have used PC-Windows version of WWWISIS 3.2c on a Pentium II system with Windows 95 OS and OMNIHTTPd Web server.

To load records into a CDS/ISIS database, a Field Definition Table (FDT) is created using a built function of CDS/ISIS. The FDT for the database, `CCODW` is as shown in the table below.

Field Definition Table (FDT)

Tag	Name	Length	Type	Rep	Delimiter
10	Author	200	X	R	
20	Title	200	X		
30	Source	200	X		
35	Year	25	X		
40	Kword	250	X	R	
50	Discipline	30	X		
60	Doctype	30	X		
70	Lang	20	X		
80	Address	200	X		
90	ISSN	9	X		
100	Publisher	200	X		
110	Abstract	1650	X		

Having defined the FDT (database structure), one can populate the database by loading records. The records can be loaded in any of the following three ways:

- Manually enter the data using worksheets, created during database design,
- Import records from a file, which conforms to ISO 2709 file format, or
- Use the CDS/ISIS Pascal programming interface to load records from a file.

I have written a Pascal program to load around 1000 sample bibliographic records into CDS/ISIS database. The program listing and a sample record are given in the appendix I and appendix III respectively.

The CDS/ISIS database thus created can be easily interfaced with WWWISIS to provide access to this database on the Internet. The database can also be queried using WWWISIS in the command prompt.

WWWISIS db=ccodw bool=elastic pft=mfn,v20/

This command would search the CDS/ISIS database, *ccodw* for the term *elastic* & then display the record number (mfn) and the *title* of all the references that match the search term, *elastic*. A sample record is given below:

000018 The influence of longitudinal vibrations of an elastic wall on natural frequencies of rectangular acoustic resonators

The following is a call to WWWISIS using the *cgi* parameter:

WWWISIS cgi=@ccod.cgi

The cgi parameter specifies the file, ccod.cgi, which contains a format specification that will generate the actual execution parameters, one per line.

```
'db=ccodw'  
bool=elastic'  
'pft=@ccodw.pft'
```

This call to WWWISIS with cgi parameter will retrieve the same set of records as with previous call. ccodw.pft is a CDS/ISIS display format file

However, it is through WWW CGI that WWWISIS acts as CDS/ISIS database server for Internet/WWW. CGI is an integral part of WWW servers that provides a mechanism to call other programs. Thus, requests from a WWW browser to a Web server may be sent to program or a script, which in turn may retrieve data from a database and send the output back to the Web server, that transfers it to the Web browser, usually in HTML format.

The most common way to gather data in a Web browser is through forms. Form is an element of the HTML language that allows the specification of input elements, such as field text, list box, check box, radio box, etc. A CDS/ISIS search, for example, may be typed into an input element of the type text and search limits may be collected via elements type list, check or radio boxes. Figure 5 is screen shot of a HTML form used for searching the CDS/ISIS database.

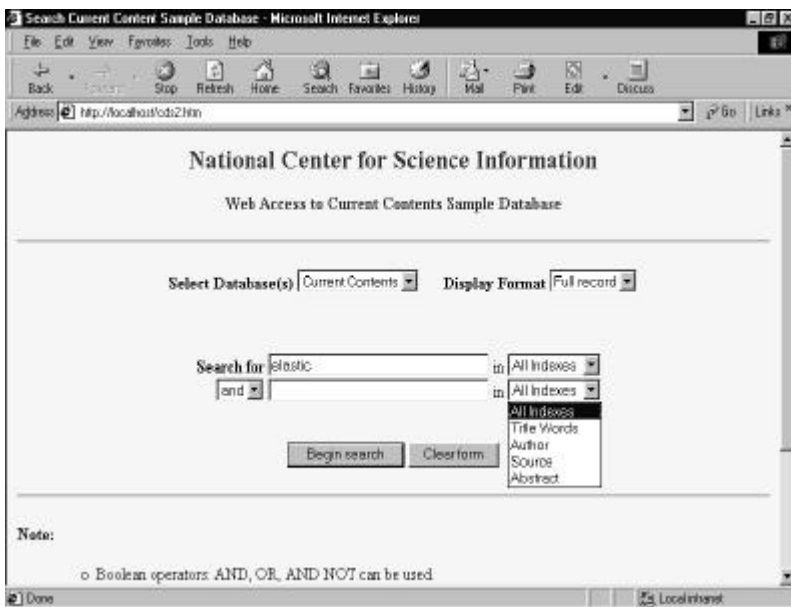


Figure 3: Screen shot of a HTML form used for searching CDS/ISIS database

Every FORM input element has two basic attributes associated; the name that identifies the input element instance and the value assigned to it. A key attribute of the FORM element is ACTION, which allows the specification of the name of the program or script to be activated via CGI.

To interface the sample database, ccodw, with WWWISIS in a WWW client/server environment, an HTML form as illustrated above is designed. The following is a sample specification of this form in HTML: The complete HTML code for the form is given in the appendix II

```
<html>
...
...
<form method=POST action="/cgi-bin/ccod.bat">
<select name="db^t5000">
  <option value="/isis/cds">CDS</option>
  <option value="/isis/data/ccodw">Current Contents</option>
</select>
<input type=text name="sterm^t5001" size="30" value=""> in
<select name="index^t5021">
  <option selected value="">All Indexes</option>
  <option value="/(24)">Title Words</option>
  <option value="/(70)">Author</option>
  <option value="/(30)">Source</option>
  <option value="/(110)">Abstract</option>
</select>
...
...
</form>
</html>
```

When WWWISIS starts, it first creates in memory an CDS/ISIS master file record called CGI-environment virtual record. This record is used by WWWISIS to store data sent by the Web server to the CGI process.

When name contains the sub-field identifier ^t followed by a number, this will be the data field tag (<input type=text name="sterm^t5001" size="30" value="">) number in which value will be stored in the CGI-environment virtual record. The search term entered in the form will be stored in data field tag 5001 and the name of the database will be stored in the field tag 5000.

When this form is submitted, the script file or the program file specified in the ACTION attribute of FORM element (<form method=POST action="/cgi-

`bin/ccod.bat">)` gets executed. Here, the batch file, CCOD.BAT gets executed. The batch file contains just the following one line:

WWWISIS CGI=@CCWEB.CGI

WWWISIS is being called with CGI parameter. CCWEB.CGI file contains following specifications:

```
'bool=',v5001/  
'db=',v5000/  
'pft=@cds1.pft/'
```

So, WWWISIS gets values for all the three mandatory parameters, namely db, bool and pft when the form is filled and submitted, WWWISIS would search the database, and then display the results according to the specifications in the pft parameter. Figure 4 illustrates the interaction of Web browser, Web server, CGI script/program, WWWISIS and the CDS/ISIS database.

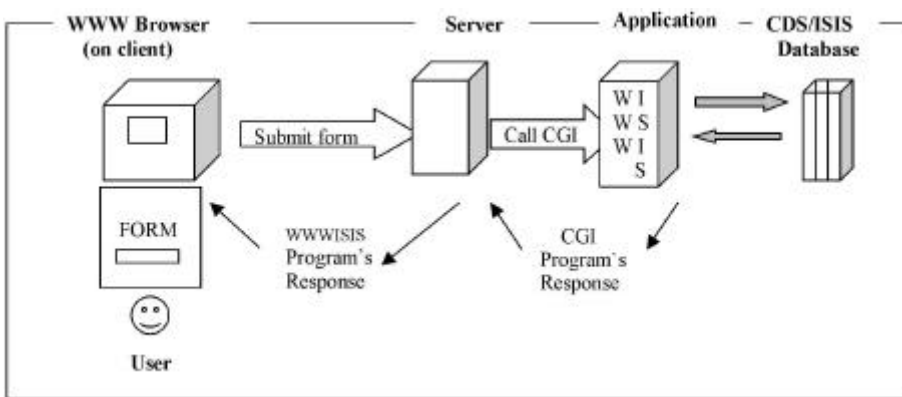


Figure 4: WWWISIS and its operation

Having received the three mandatory parameters, WWWISIS searches the CDS/ISIS database and the retrieved records are sent to the Web browser for display after formatting the records according to the specifications in the pft file. A screen-shot of records being displayed through a Web browser is shown figure 5.



Figure 5: Screen-shot of record display.

Conclusions

WWWISIS is a very convenient tool for providing Web access to CDS/ISIS databases. The task of interfacing CDS/ISIS databases with WWWISIS is quite simple. Any person with a working knowledge of HTML coding and basic knowledge of working of Web server software should be in position to publish the CDS/ISIS databases on the Web.

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Appendix I

program loadtit:

```
var
i,j,line_len,blank_pos,blank_pos2,trecs,no_recs,rec_cnt,tagval : real;
srce,delmtr,infile,outfile,inp_line,fldname,fldval,fldname1,next_rec : string;
delmtr_1 : string;

procedure delimiter(delmtr_1 : string;tagval : real);

var
k,l,m : real;

begin
k:=0.0;
l:=1.0;
m:=9.0;
fldname:="";
while k<= blank_pos2 do
begin
j:=position(fldval,delmtr_1,l);
if j=0 then
begin
fldname:=substr(fldval,l,blank_pos2);
k:=line_len+1;
i:=fldadd(tagval,nfields+1, fldname);
{ writeln('fldname1:',fldname);}
fldname:="";
end
else
begin
fldname:=substr(fldval,l,j-1);
l:=j+2;
i:=fldadd(tagval,nfields+1, fldname);
k:=j;
{ writeln('fldname2:',fldname,'j:',j);}
fldname:="";
end;
end;
end;

begin
clear;
rec_cnt:=0.0;
write('Pl. Enter Input File Name : ');
readln(infile);
{ write('No. of Recs. to load : ');
readln(no_recs);
assign('inp',infile);
readln(inp,inp_line); {read from input file}
```

```

while rec_cnt <= no_recs do
while not eof(inp)
begin
i:=newrec;
next_rec:=false';
while (next_rec <> 'true') do { loop till the next record }
begin
readln(inp,inp_line);
fldname:=substr(inp_line,1,6);
if fldname='Record' then
begin
update;{ update the database }
next_rec:=true';
writeln('New Rec:');
rec_cnt:=rec_cnt+1;
end
else
begin
line_len:=size(inp_line);
blank_pos:=0.0;
blank_pos2:=0.0;
blank_pos:=position(inp_line,chr(09),1); { find the first occurrence of a tab char }
{ writeln('line len:',line_len,' blank_pos:',blank_pos, line_len-blank_pos);}
blank_pos2:=line_len-(blank_pos+1);
fldname:=substr(inp_line,1,blank_pos-1); { sub str till the first tab }
fldval:=substr(inp_line,blank_pos+1,blank_pos2);
if fldname='Authors' then
begin
delimiter(', ',10);
end;
if fldname='Title' then
i:=fldadd(20,nfields+1,fldval);
if fldname='Full source' then
begin
j:=0.0;
j:=position(fldval,', ',1);
srce:=substr(fldval,1,j-1);
i:=fldadd(30,nfields+1,srce);
srce:=";
srce:=substr(fldval,j+2,blank_pos2-(j+1));
i:=fldadd(31,nfields+1,srce);
j:=0.0;
srce:=";
end;
if fldname='KeyWords Plus' then
begin
delimiter(', ',40);
end;
if fldname='Author keywords' then
begin
delimiter(', ',35);

```


Appendix III

A Sample bibliographic record.

Authors JDH Paul, F Appel, R Wagner
Title The compression behaviour of niobium alloyed gamma-titanium aluminides
Full source Acta Materialia, 1998, Vol 46, Iss 4, pp 1075-1085
KeyWords Plus OXIDATION BEHAVIOR; NB
TGA/Book No. YZ762
Discipline Metallurgy
Document type Article
Language English
Address Paul JDH, Gkss Forschungszentrum Geesthacht GmbH, Inst Mat Res, Max Planck Str, D-21502 Geesthacht, GERMANY
ISBN/ISSN 1359-6454
Publisher Pergamon-Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford, England OX5 1GB
Abstract The underlying mechanisms behind the reported high strength of titanium aluminide alloys containing a large addition of niobium has been investigated by determining the flow stresses and activation parameters of plastic deformation. It has been found that alloys such as Ti-45Al-10Nb (at.%) and Ti-45Al-5Nb have 1.25% flow stress values in compression of >800 MPa at room temperature and > 500 MPa at 1173 K. When compared with values from a more conventional alloy, Ti-47Al-2Cr-0.2Si, they represent a considerable increase in strength. However, the activation volumes after 1.25% deformation are very similar to those of conventional alloys, particularly up to 973 K. This suggests that athermal dislocation mechanisms are responsible for the increased flow stress of the niobium containing alloys. By comparing the properties of the niobium containing alloys with different binary alloys it has been shown that the high strength is solely a result of the reduced aluminium content and that niobium plays no role in strengthening or work hardening.

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CDS/ISIS: THE LAGOS BUSINESS SCHOOL EXPERIENCE*

By Patricia Okiemute Idahosa

Introduction

Since the beginning of the 1980's, the Nigeria Library scene has witnessed a wave in automation, from the automation in some Nigerian Universities to the success stories of special Libraries of the like of the International Institute of Tropical Agriculture (IITA). The need for Library automation was informed by the need to improve library service to its users, to make the library more user-friendly and to evolve with international trends. This quest for automation has been beset by a number of problems amongst which are the wrong concept of automation, the cost of acquiring the needed hardware and training for the concerned personnel, prominent among these problems is the cost of procuring an effective library software.

UNESCO, in 1985 found a solution to the software problem by developing the Computerised Development System/Integrated Set of Information Systems (CDS/ISIS). Designed for small special and corporate libraries, as well as sections of large academic libraries, the CDS/ISIS is a non-numerical bibliographic information storage and retrieval software package. Most of the support for and development of this package was provided by Del Bigio who adapted it from the mainframe version, developed in late 1960s.

The essential features of CDS/ISIS:

- a. Handling of variable length records and sub-fields;
- b. Database definition component allowing the user to define the data to be processed for a particular application;
- c. Data entry component for entering and modifying data through user-created data base worksheet;

* Paper presented for the GLOBAL 2000 Worldwide Conference on Special Librarianship, 16-19 October 2000 in Brighton, UK

- d. A retrieval system using a search language that provides for field-level and proximity search operators, in addition to the traditional and/or/not operators, as well as free-text searching.
- e. A powerful sorting and report generating facility for directories, catalogue, indexes, etc;
- f. A data interchange function based on the ISO 2709;
- g. An integrated application development programming language (CDS/ISIS Pascal), this allows each user to tailor the system to specific needs; and
- h. Functions allowing the user to build interrelationship between data bases.

The Development of CDS/ISIS

In late 1985, version 1.0 was released. This version took into account the fact that many personal computers (PC) had no hard disk. The data and programs were put on the same diskette so that they could run on such machines. The main hardware and software requirement were on IBM PC/XT/AT and compatibles, 512KB of computer memory (RAM), a floppy disk drive and a hard disk under the operating system DOS 2.0 or higher. The main focus of this version was the exchange of bibliographic data while its major shortcoming was that it could only take 32000 records. While version 2.0 was released in 1987, it was not widely circulated till March 1989. In May 1992, version 3.0 was released. The main feature of this version is the support of Local Area Network (LAN). Although it was possible to run a network by specifying certain parameters of with version 2.3, there was the danger of file corruption if two users tried to update or make changes on a particular record at the same time. The addition of the record locking and database locking feature has resolved this problem. The 3.07 version was released soon after, with some improvements. The latest is version 1.0 for Windows released in 1998, it is designed to run in Windows environment.

General Overview

CDS/ISIS is menu-driven. The main menu leads to sub-menus, a system which makes the package easy to operate. Its record is of variable length text fields and indexing techniques, with sub-fields and formatting language. The structure of the package is to give the Librarian autonomy in deciding and designing what is needed to meet the information needs of his/her library. In many ways, it is unlike other bibliographic database such as TinLib and dBASE, where all the structures has been pre-defined and cannot be modified or edited to serve specialised needs. The major element with CDS/ISIS is that the Librarian needs to know his/her organisation goals, its users, the role the library is to play in the total organisational

structure as well as its unique role as information provider. Armed with this information, the Librarian can patiently work on the CDS/ISIS to get the desired result. From the foregoing characteristics, CDS/ISIS can best be described as a blank board with instruction for the Librarian to design a library data base. It may seem difficult and uninteresting at the beginning, however, with appropriate training, it becomes a pack of cards to be dismantled and reassembled at will and with great pleasure.

Many of the bibliographic packages commercially available literally constrain the Librarian by pre-defining all the working parameters of the system, however, the designers of CDS/ISIS have reversed this situation, by ensuring that at full application, the Librarian is a master and not a slave of the system. The time and dedication needed to master the workings of CDS/ISIS has resulted in it being branded as unfriendly by many users who are accustomed to fully designed commercially available packages. This reaction can be very well understood, when the level of computer literacy of Librarians in many countries of Africa and their attitude to library automation is taken into consideration.

CDS/ISIS operate in a multiple access environment, this simply means that it operates in a LAN environment and can be operated by more than one user at a time. As a result of the multiple user feature, security facilities for it are available. Here some users on the LAN are denied access to some operations of the package by the network manager through menu design, or pass word. CDS/ISIS can be operated as an integrated library automation system comprising all aspects of library operations -acquisition to circulation as a single data base of all library holdings (books, journals, etc); or in models with each library function operating independent of others. In whatever form it is operated, only one database can be run at a time.

The Lagos Business School Library

The Lagos Business School (LBS) is a not-for-profit, non-governmental institution funded by The African Development Foundation, It started functional operation in 1991 with the primary aim of providing international standard executive education to the Nigerian business class as well as countries south of the Sahara. It believes in the holistic nature of knowledge and thus places emphasis on the ethical, intellectual, emotional and spiritual components of learning. To achieve an international learning environment, there was the need to develop a research and information centre capable of providing an efficient, functional and organised information resource base for proper academic work. It was in line with this objective that the LBS embarked on the setting up of a library.

At the conception of the LBS library, automation was the only option considered, however, the software for the automation became a big issue as some of the commercially available ones were prohibitively expensive.

An institution with a well developed computer department, the LBS considered that an in-house software should be developed. Efforts were made using FoxPro, however, its shortcoming made it impracticable to use. It was at this point that CDS/ISIS was considered as a necessary option, based on zero cost availability, and the librarian's working knowledge of the package. Accepting CDS/ISIS as the software for the library automation was just the beginning of a long process of convincing, negotiating, and educating the computer department and management. The computer department had to be educated on the workings of a library, the objective of the LBS library as it relates to the School's research activities as well as to its public image. This was very important because unless these issues are well understood, it becomes difficult, if not impossible to get the full co-operation of the relevant personnel, whose co-operation is needed for the installation of the software as well as its effective operation on the network, and provision of other support services that may arise in the course of operating the system.

The management had to be educated as to the many advantages of the software apart from its cost effectiveness. To management, the security of the records, multiple access, easy of manipulation, data import and export as well as type of libraries using the system were considered factors. However, the most critical factor is a good working knowledge of the software and ability to present and demonstrate an effective use of it. It becomes more difficult to convince management to adopt the package, if the Librarian had no knowledge of the system and required to be trained on it. Thus, an institution can adapt CDS/ISIS by either subtle compulsion, that is making it a part of a larger proposal to a donor agency, with emphasis on training (functional training at local site ie the trainee library). Alternatively, as with the LBS, where the Librarian is knowledgeable, educate the approving authorities.

Implementation of CDS/ISIS

The implementation of CDS/ISIS at the LBS library went through a number of phases, these phases were designed to ensure that the library played its role of servicing the educational and research needs of its faculty staff, students and administration personnel as well as its potential users from related institutions. A user needs survey was conducted to determine the information needs of the library primary users (teaching, research and administrative staff), namely: how they want the information packaged or presented on computer screen; what aspect of a

record, book, journal etc is more important to them; and how frequently do they need the information imprint or on screen. This survey was conducted via questionnaires and interviews. The response from this survey was the major ingredient used in the design of the data base (setting parameters, inverted file generation, display format and accessibility on the network). The survey took about four weeks to complete.

When the data base was functionally set-up, to assess the extent to which primary users needs were met, a sample population was requested to operate the system and give functional criticism on its working principle and as a tool for achieving their information requirements. This objective criticism proved very helpful as it pointed out certain fine details which had been ignored at the beginning. The result was a fine tuned data base that met the actual needs of its primary users. The potential users were taken care of within the scope of the service provided to the primary users. The trial period took three weeks.

The Computer Department personnel were effectively involved in the implementation of CDS/ISIS at the LBS library. From the result of the above survey, the computer personnel were informed and educated on the workings of the system as it relates to the result of the survey. This was as a means of obtaining their co-operation and support, a vital factor in the successful implementation of the system. A period of two weeks was allowed for the computer personnel to run and study the system, to enable them have a detailed understanding of its working principles and most importantly how and why it was set up (parameter definition, inverted file definition and search formulation) in its present form. At the end of the trial period, the data entry process began with the most recent acquisitions, in other words, the documents recently purchased were entered first and as time permits, older ones were entered. This method ensured that current publications did not suffer process delay. This applied to all publications (books, journal, reports, conference papers, etc).

The data input was done with original documents, same applied to the retrospective documents. At the time of the automation, the library had about five hundred (500) book titles, five journal titles and few reports. This made management of the records relatively easy. It took about six months to input all the retrospective documents. The system is customised to meet the information needs of the users.

The library functions are fully automated, these functions are the cataloguing, circulation, acquisition, books and serials. The system is a single database with a two page worksheet integrating all the above functions. The sub-fields facility of the CDS/ISIS is used to manage the circulation operations. The full automation of

the library was planned from inception, therefore, in the design of the field parameter all the functional needs of the data base was considered and provided for.

However, during the three weeks trial period that the database was run, some minor parameter changes were made.

Being an integrating system makes it possible to retrieve information using a series of search methods, the most used being the subject search. The author, title, year of publication, abstract and key words alone or combined are used for information retrieval operations. This multi search method makes it relatively easy to trace an information easily. This search function is the only function of the database that is made available to its user. All faculty staff can access the library from the computers on their desk, while there are four PCS in the library accessible to the external users of the library. The other functions of the database such as the cataloguing, circulation, acquisition are protected by pass word known only to the Librarian.

Data Base Audit

To audit a database, the entire records is printed out, this is then manually read thoroughly to identify wrong entry, spelling errors, unwanted keywords, and a harmonisation of the index. All corrections are then entered into the system and a full inverted file update is done. It is important to note the last Master file number of the records, so that at the next audit, there will be no repetition. The database audit is pains taking and time consuming. It is however, very vital to the efficient and effective management of the library. It also helps with the development of a personalised thesaurus for the library. This is because over time, keywords get defined and their allocation in the description of library materials become consistent. For a specialised library like the Lagos Business School Library, the need to develop a functional thesaurus cannot be over emphasised.

Cost Implications

The cost implication of implementing CSD/ISIS is two fold, the quantitative (monetary cost) and qualitative (dedicated time and intellectual energy). In monetary terms, what is needed is a computer a printer and training cost of Library personnel. A conservative estimate of five thousand dollars (\$5000) should suffice for equipment cost, while the training of the library personnel over a period of segmented six months will require about \$5000 (within and outside local environment). Qualitatively, it takes a lot of persuasion and determination to get the approval, co-operation and commitment of authority concerned to see the implementation of the system. On the part of the Librarian, the drive to achieve

result, patience to repeat the same process over and over again (this is what it takes to be a master of the system) and willingness to pull other departments, for example the computer department along. In a situation where the Librarian has little or no knowledge of the system, primary knowledge should be sought from surrounding libraries before proposing it to the institution. This will help in arguing for its adoption by the institution.

Future Plans

The library plans to embark on expansion of its physical and material facilities in order to accommodate its growing number of users and meeting their needs. It plans to provide more computers in the library as well computer points, so that library users can come in with their Laptops, connect it to the school network and work. The School has full Internet access, and it plans to make available on the Internet its list of holdings. At the moment, it is not certain if the CDS/ISIS has Internet compatible facilities, however this has been investigated by the computer personnel. Their final report will help to determine the extent to which the library can operate on the Internet.

Conclusion

CDS/ISIS has come to launch libraries in developing countries into the age of rapid automation. It has made it possible for libraries with small budgets and minimum external funding to operate efficient and functional libraries. The accusation of being user unfriendly levelled at the package is due primarily to the reluctance of Librarians to recognise and accept the ability to customise their library automation environment, to meet their specific needs. This can be related to the whole concept of library automation in this part of the world, where it is conceived to be the responsibility of a computer guru to set parameters of the library system; or get an already made commercial system that entails only data entry, no personal input for developing it. The developers of CDS/ISIS must be congratulated for awaking in the Librarian the need to see beyond what is available, and beginning to think more about how to create a functional automated library environment using CDS/ISIS. The result is greater self confidence and mastery of the system. In addition, Librarian needs to develop their negotiation and persuasive skills, this what is often needed in building teams that work. CDS/ISIS will be friendly with you if you take time to develop friendship with it.

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CONTINUING PROFESSIONAL EDUCATION OF LIBRARIANS WORKING IN THE UNIVERSITY LIBRARIES OF PAKISTAN AND AZAD JAMMU AND KASHMIR*

By Muhammad Yaqub Chaudhary

Introduction

Every profession in this modern age must continuously adapt itself to the rapidly evolving technological society. Keeping up with the today's constant change and innovation is a challenging task, but one must undertake it to operate successfully in the world. The task is formidable because new information is appearing at an overwhelming rate. The proliferation of knowledge, referred to earlier as the "information explosion" and recently as the "information revolution," is affecting all professionals; but none more than the librarian. As they are located at the center of the blast, they must hasten to implement the advancements in library science in order to handle the mass of new information in all the areas of knowledge. This means that library personnel have a special responsibility to keep themselves up-to-date with developments in their field.

The factors that have promoted discussions of continuing education for librarianship have been: 1) the vast growth of new knowledge; 2) introduction of new technology in libraries; 3) social needs of an increasing highly educated populace; 4) outreach programs to attract new groups of patrons; and 5) changing trends in library services.

Academic libraries have special characteristics and functions of their own, which give the academic librarian a special responsibility for professional growth. The basic purpose of an academic library is to support academic programs. Gates cites that "The primary characteristic of a good academic library is its complete identification with its own institution. The measure of its excellence is the extent to which its resources and services support the institution's objectives."² About thirty years later Buckland (1989) echoed this opinion that "The foundations of academic

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¹ Robert Means, "A Study of the Continuing Education Interests of Illinois Community College Library and Learning Center Personnel," *Illinois Libraries* 60 (May 1978).

² Jean Key Gates, *Introduction to Librarianship* (New York: McGraw Hill Book Company, c1968).

librarianship have two basic elements: (1) the role of library service is to facilitate access to documents; and (2) the mission of an academic library is to support the mission of the academic institution served.”³

The academic library should and does promote the necessary means to support the institution’s objectives. These methods require that academic librarians must be willing to go beyond acquiring and making available the usual library materials in establishing innovative library services, such services that may vary from one library to another and from one librarian to another for the basic purpose of translating the institution’s objectives into meaningful services.

Today, academic libraries are heavily influenced by modern technologies. We see changes from the traditional paper materials to electronic media. Moreover, library operations have changed extensively from manual to online practices. Book or card catalogs have been replaced by the more advanced Online Public Access Catalogs (OPACs). The same is true when dealing with indexes and other information retrieving tools. The drastic changes in the information technology are forcing library and information scientists to adopt futuristic approaches. The role of future academic libraries will be decided largely by the dedication and proficiency of their personnel or work force. Thus, academic librarians need to be prepared to face forthcoming changes and unforeseeable future situations.

Since the 1970s, however, CET [Continuing Education and Training] activities have assumed a more urgent priority in the affairs of LIS professional bodies. Accountants, engineers, solicitors, surveyors, midwives, pharmacists, doctors, architects, those in the construction industry, nurses - all have elevated CET into a matter of primary professional concern.

Continuing Education is essential for all library personnel, professional as well as supportive, whether they remain within a position category or are preparing to move into a higher one. Continuing education opportunities include both formal and informal learning situations, and need not be limited to library subjects or the offerings of library schools.

The "continuing education" which leads to eligibility for Senior Librarian or Specialist positions may take any of the forms suggested directly above, so long as the additional education and experience are relevant to the responsibilities of the assignment. To encourage CET library administrators must be supportive and provide opportunities (in the form of leaves, sabbaticals, and released time) for continuing education of their staff.

³ Michael K. Buckland, "Foundations of Academic Librarianship," *College and Research Libraries* 50 (July 1989).

A further sign of the growing interest in continuing education for librarians was the July 1971 issue of *Library Trends*, which was entirely devoted to this subject. Margaret Steig wrote in 1980 that "Continuing education become Continuing Education (CE) with capital letters. Articles began to appear in every journal; continuing education achieved the dignity of a subject heading in library literature. We acquired an organization CLENE (Continuing Library Education Network), dedicated to it. Continuing education opportunities proliferated. A multitude of courses, workshops, institutes, seminars, and other formal education experiences have been offered in the last decade."⁴

Continuing professional education is a lifelong learning and is indispensable for professional growth and instrumental for sustaining one's competence. Publication explosion, evolution of new sophisticated information technologies, and highly educated population require special training and education on the part of the librarians to cope with the specialized needs of the growing information society.

Our population is increasingly becoming better educated. It is obvious that corresponding to the quality of education, demand for library services also increases. In an educated society library users demand high level personalized services. All these goals can only be achieved while we keep ourselves up-to-date in information providing techniques, which could be achieved through continuing professional education.

Continuing education can be had through both formal and informal means and it enables a professional to perform his/her role effectively and efficiently. The continuing professional education of librarians is a vital issue throughout the library world; because immense technological developments are causing rapid shifts and changes in the library profession. As well as traditional ways of acquiring, processing, storing and retrieving information have been changed by computers and telecommunication systems. The outcome of these changes has started resulting occupational obsolescence, which is not affordable in librarianship.

Analysis of the Need Assessment

There are three areas of analysis for Continuing Education, which need assessment:

- 1) the information providing environment, rapidly changing with the tremendous advancement of knowledge; development of sophisticated information

⁴ Margaret F. Steig, "Continuing Education and the Reference Librarian in the Academic and Research Library," *Library Journal* 105 (December 15, 1980).

technology for information storage and retrieval; and multifarious users' demands;

- 2) information consumer's needs and his/her desire to update himself/herself; and
- 3) information provider's ability and command in providing cost-effective, accurate and timely information by knowing the exact requirement(s) of learners.

University Education

It has been said that Marx tried to reform society by changing social institutions, and Jesus tried to reform society by changing the hearts of people. In Quran (Holy book of Muslims) the first revelation from God to Prophet Mohammad was an order of *Iqra*..... means read.⁵ It indicates the importance of education in Islam. In our age education plays a pivotal role in transforming the society. It is the key to the social, economic, and technological development of a nation. Education is fundamental to social progress and reforms. Education leads society to formulate its own purposes, and directs to organize means and sources to achieve its objectives. The role of university in transforming the society is particularly critical because it educates virtually all the people who are destined for leadership in our society from all walks of life. Its main duty is to prepare leadership through sound liberal learning not only during the period of formal education but also throughout their lives. So university is responsible to turnout well-educated population for the leadership of the nation. Information technology policy of Government of Pakistan says that, "Education determines, more than anything else, a country's prospect for human development and competitiveness. Fortunately, the information revolution offers some extra ordinary opportunities in education".⁶

All universities are associated with three basic objectives:

- a) *Teaching*
- b) *Research*
- c) *Public services*

Teaching passes world's knowledge from generation to generation. It prepares people for different occupations and adds to the human knowledge through research and development. It Research means creating new knowledge and new ideas. In Pakistan, university teachers don't take research seriously. The teachers spend almost all the time in teaching, leaving little or no time for research.

⁵ The Holy Quran: A translation by A.J. Arberry, Surach No. 96.

⁶ IT policy of Pakistan 2000, Information Technology Commission, Government of Pakistan. URL http://www.itcomm.gov.pk/itpolicy_august2K/31_32.htm

Inadequate budgets and research tools are the major obstacles to research. The third objective of the university is to provide services to community. They are expected to provide assistance in solving community problems like pollution, malnutrition, shelter, etc.

A university library functions to achieve these objectives. It provides print and non-print material to support instructional programs, and to encourage and develop reading habits among its community. The university library also provides material for faculty to prepare their courses of instructions and for research purposes.

In order to know the opinions of the university practicing librarians regarding their post formal professional education activities, a questionnaire will be developed for the librarians. Following are the important questions to be explored through this questionnaire:

a) Age groups:

Age groups are very important for two reasons: 1) those illustrate the range of possible nature, behavior, and potential at various points in life; 2) the age groups have an impact on learning and receptivity.

b) Job Satisfaction:

It is quite natural that a professional with a satisfied job will be more interested in his/her professional growth. If a professional is not satisfied with the job, employer must take care of it to avoid deterioration in productivity.

c) Keeping up to date with Literature:

It is commonly assumed that one of the most effective ways to remain professionally updated is reading professional literature. Respondents will be asked to describe about their reading professional literature in one year, e.g., number of articles, number of books, etc., on library and information science.

d) Perceived Importance of Continuing Education:

A list of activities like attending workshops, writing research papers, attending professional meetings, etc., will be provided to the population and they will be asked that how much importance they attach to each activity in their professional development.

e) Incentives for Continuing Education:

The interaction between an employee's expectations on the job and what does a supervisor expect of him constitutes the factors which effect the job motivation and productivity. The respondents will be asked to mark factors, which encourage or might encourage them for continuing education.

f) Obstacles to Continuing Education:

Respondents will be asked to mention factors, which discourage or might discourage them in future in taking part in continuing education programs.

g) Providers of Continuing Education:

Although individuals assume primary responsibility for their own professional growth, continuing education is the result of shared responsibility as well as cooperation and interaction among library education institutions, employers and a wide variety of professional and educational associations. Respondents will be asked to rank the providers of continuing education in order of their perceived importance.

Significance of the Study

This study will explore the needs of university librarians in Pakistan and Azad Jammu and Kashmir, and the ways and means to meet the continuing education needs of these librarians. It is expected that the results of this study will be of practical importance to design continuing education programs for the university librarians.

- The study will contribute to the general knowledge of university librarians with special reference to professional development.
- It will define the current practices about continuing education activities in Pakistani and Azad Jammu and Kashmir's library environment.
- It will determine the librarians' needs and preferences for continuing education activities.
- It will identify the obstacles to the continuing education programs.
- It will identify different methods to motivate librarians toward continuing education programs.
- The findings will be important for university administration to take necessary steps for the promotion of continuing education programs among librarians

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