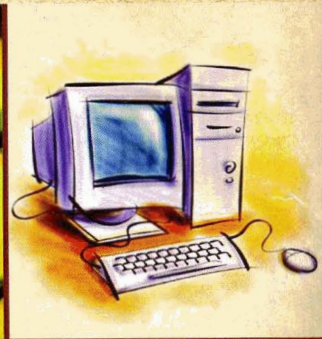
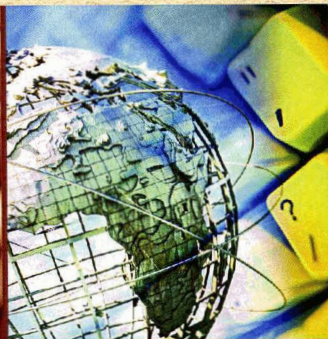
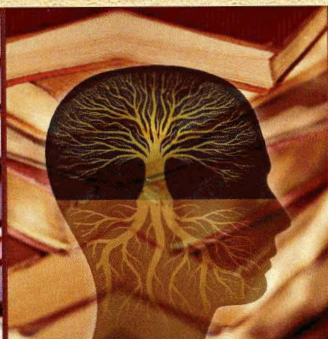
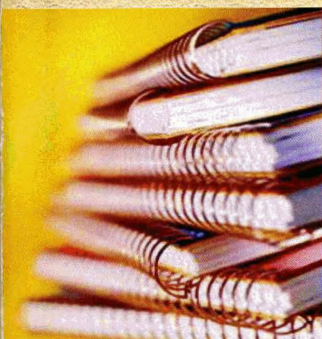


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Transforming Traditional Libraries into Digital Library

V. EDWIN JOSEPH¹ and V. MOHAN²

ABSTRACT

Information technology (IT) developments have changed the ICAR, ICMR, and CSIR Institutes' libraries over the last few decades and speculates about further changes to come. The study discussed a 3 phase procession of the effects of IT on organization: modernization, innovation and transformation. The first stage of the study is to dominate by the theme of computerization of library applied a growing range of IT in the management of collection of primarily print on agriculture, industry and medical science information. The second stage is the rise of public access through LAN and WAN shared information it's resulted that Public Access Cataloguing (PAC), abstracting and indexing databases (CDRom database) had become quite large as a result of respective conversion programs for older books and some years of use in cataloguing new acquisitions. The development of automation age, print content goes electronic, online catalogue through widely popular rapidly created demand for actual content in digital form. The third stage is the innovation and transformation of information the institutions characterized by an enormous, exhilarating flowering of innovation, creativity and experimentation. The libraries must turn their attention to defining their mission and activities in relationship to their transforming information. Numerous troubles some issues had already encountered. High cost, pricing, licensing copy right, uninterrupted online access, perpetual access to back issues etc. will be much harder and more challenging issues.

We are living in an era of insecurity, instability and uncertainty. Though World Wide Web (www) and Information and Communication Technology are providing new opportunities for libraries, the information privacy, information security and copyrights are among some of the concerns that need to be addressed to ensure the structural and functional stability of the libraries as a social institution. It is important to note that concern for privacy among users is an important hurdle in the expansion of virtual communication, transfer and use of information. The invention of printing

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by Gutenberg in the fifteenth century, and the introduction of computers were two main ingredients for R & D scholarly information and communication. The information technology generates remarkable progress in all walks of agriculture, industry and medicine. This is a very helpful way of understanding what has happened to special libraries in the latter part of twentieth century. The library professional has to preserve the past, serve the present and build the future. In modern special libraries which is dynamic information storage and retrieval centre, the literature explosion in different discipline, different types of databases, resources and services, format-based libraries are a manifestation of this shift. Over the last three decades a significant transformation has been noticed in special libraries in collection development policies and practices.

This paper is an attempt to bring various issues to spotlight that can impede the transformation process in ICAR, CSIR and ICMR institute's libraries.

ICAR Institutes Libraries in Automation

ICAR has taken a several efforts to transform the traditional library into digital libraries. The latest challenges of technological development enabled the libraries to offer various services by implementing the Randhwan Committee (1960), Indo American Agriculture Library Survey (1965) headed by Dr Dorthy Parker, Ramaiah Committee (1969). The recommendation of these committees created deep awareness among the ICAR Institutes and State Agricultural Universities library professionals and administrators in meeting the challenges of providing better library services. Although most of the recommendations made by these committees have been since accepted ICAR however, few were implemented. In 1991 under the World Bank fund, Agriculture Research Information System (ARIS) with in Indian National Agriculture Research System initiated for strengthening information and management culture.

- World Bank funds were provided for purchase of computers and necessary infrastructure for digitization
- In order to modernize the libraries and information centers a total budget of Rs 130 crore under NATP project (National Agriculture Technology Project), Rs 94 crore has been allocated for ARIS and Rs 36 crore for development of library component in Information System Development by providing computerized electronic database
- Creating digital environment by linking all ICAR Institutes
- Agriculture Research Library and Information System (ARLIS) is one of the modules of ARIS for library improvement and networking. It has been developed under Information Development Scheme (ISD).
- ARIS envisages that the library services should be improved by means of network using computers and satellite communications technology, Internet through ERNET/NICNET.
- To achieve digital environment in agricultural libraries national level training for database creating, websites designing, networking and e-resources management were provided to library professionals.

CSIR Laboratory/Institutes, Libraries in Modernization

The Council of Scientific and Industrial Research (CSIR) with a chain of 38 laboratories has spread across the country. It has been responsible for pioneering research in all aspects of scientific and industrial research covering broadly chemical, physical, biological, information, environmental and engineering science and technology. Most of the laboratories have well established library and documentation centers.

CSIR spends annually about Rs 25 crores for journals subscription alone. Put together all the 38 Labs of CSIR subscribe to as many as 3,356 foreign research and scholarly journal title annually. During the Tenth Five Year plan under the project of National Digital Library, all the CSIR libraries have been networked. Even libraries with good budgets or collection cannot have enough resources to be self sufficient. In fact, interdependence has now become a way of library. During the period we have witnessed the establishment of a great number of networks around the country through which technology is utilized to facilitate a vast flow of information. The major factors which have created the need for networking include the national and international in the high cost of publications, lack of funds and adequate manpower and the geographical dislocations of libraries. The benefits which accrue from resource sharing are the following.

- Preparation of union catalogue
- Preparation of cataloging data
- Provision of bibliographies
- Optimum utilization of rare collection
- Cooperative exchange and distribution of storage documents
- Savings of both technical and collection development
- Reduction in the cost of library services in the long run and
- The provision of more material at low cost and less time

CSIR has made rapid growth in recent decades in the networking.

ICMR Institutes Libraries in Automation Age

The Indian Council of Medical Research (ICMR) started in 1911 in the name of Indian Research Fund Association. In 1949 it has been re-designated as ICMR. The institute has a glorious tradition of research on medical sciences. To modernize the libraries ICMR has taken steps to implement the following recommendations made by the Chattopadhyaya Committee (1998).

- To upgrading and modernizing libraries of various ICMR Institutes and create network among these libraries.
- To provide the latest biomedical information from print and E-databases to users
- Network with other information centers with in national and international

As part of the modernization exercise, the library has changed its face by procuring computer, laser printer, subscribing for Medline CD and Journal Citation Reports. Retro-conversion of card catalogue has effectively been done and library automation system has been introduced with GLAS (Graphical Library Automation System, US)

software to integrate circulation and collection control. To make effective functionality of the automation, barcode ID card has been issued to all users of the library. A meeting to review the progress on modernization of ICMR institutes libraries and information centres was held on April 2005 at National Institute of Occupational Health (NIOH), Ahmedabad. Based on the committee recommendation the modernization of library work assessed the following points qualitatively and quantitatively.

- Web OPAC has been established through GLAS
- MedLine CDs since inception have been purchased
- OVID is a full text electronic database covers 61 journals, the council provides required photocopy of articles from this database to all ICMR institutions on demand. The response for access of this database is considerably encouraging.
- The database, like PREQUEST further strengthens the resource sharing facility among ICMR institutions.
- Union catalogue

Union catalog of journals of all ICMR libraries has been compiled by the council. This will be beneficial to scientists to know the location and subscribed by a group of libraries with mechanism for resource sharing for both print and e-journal collection. It acts as an internal database of all articles published in these subscribed journals for searching and findings the contents in these journals.

The scientific and technical libraries working under ICAR, CSIR and ICMR have taken the lead in automation and also there were misunderstandings in the minds of librarians regarding the role of computerization. It held up computerization in India for a long time. The conventionally trained and working librarians may resist the transformation of conventional libraries into digital libraries unless they are assured of training in latest development or alternate avenues of employment. Automation of library using application of information technology emphasis on advanced computers in the upkeep of library function.

Abstracting and Indexing Services

Since 1940 or earlier the ICAR, ICMR and CSIR institutes libraries had been purchasing the **MEDLINE** (Index Medicus) for the health science, AGRICOLA, AGRIS, BIOSIS, Chemical Abstracts, ASFA (Aquatic Fisheries Science Abstracts) etc as voluminous series of printed volumes, which were very hard to use. During the 1960s and 1970s those abstracting and indexing services began to create databases in order to produce their printed products starting in the late 1960s these databases were also made available through commercial offline (CDROM) and online services like dialog or BRS, designed for use by specially trained searches. However, these online services were enormously expensive and were open mostly to researchers in R&D.

E-Journal consortium

Journals are a vital source of information for agriculture, science and technology and medical research and development. The number of periodicals at present is estimated to be 2, 50,000. Of these 25, 000 are scientific, technical and medical journals. About 15,000 are refereed scholarly periodical and 12,000 are refereed scholarly

periodicals with online. More than 2,500 among these scholarly journals are free for all. Journal titles are growing 3-folds every 15 years. Obviously no single library can afford to procure all journals even in a single discipline due to higher cost of subscription. The major research and development organizations, like ICAR, CSIR and ICMR spend around Rs 100 crores towards library acquisition. In spite of this they are not in a position to maintain the subscription of core journals. Taking into consideration with the emergence of information technology applications particularly internet there has been a major shift from traditional print journals to electronic journals (e-journals). The explosion of information and inadequate library urged the libraries to adopt new philosophies and technologies for collection development and reduce the costs of information. The libraries are forced to work together due to economic realities and technological possibilities paving the way for forming subscription group for e-journals not just group but strategic alliance with institutions having common interest (Table 1). The main aim of a consortium is to achieve what the members of the group cannot achieve individually.

Table 1. E-journal consortia in ICAR, CSIR and ICMR

Name of consortia	Participating Libraries	URL	Resources	Amount
ICAR – CeRA2008	All ICAR institutes and SAU (123)	www.cera.jccci.in	3000 e-journals	938.542 lakhs/ Phase
CSIR 2002	40	http://www.niscair.res.in	3100 e-journals	25 crores
ICMR	24	http://www.jccci.icmr.informindia.co.in	693 e-journals	NA

Objectives

- to strength the pooling sharing and electronically accessing the R&D literature
- to provide access to world S&T literature
- to nucleate the culture of electronic access resulting into evolution of digital library

CSIR e-journal consortium

CSIR entered into agreement with 14 most relevant publications identified and prioritized. After negotiation and available budgetary allocation CSIR entered into agreement with 11 publishers (Table 2) to access about 3,316 international journal across the labs. The CSIR Labs/institutes can access 1500 e-journals from Directory of Open Access Journals (DOAJ) which are free for every one.

NISCAIR's role

The NISCAIR (National Institute for Science Communication and Information Resources) which was formed by merging erstwhile INSDOC and NISCOM was identified as the CSIR consortia coordinator and a monitoring/steering committee

TRANSFORMING TRADITIONAL LIBRARIES INTO DIGITAL LIBRARY

Table 2. CSIR Consortium Subscribed e-journals

Publisher	No. of Subscribing Inst	No. of Inst. for e-access	No. of Journal for access	No. of Subscribed journals
Elsevier	38	All	1500	399
Springer	32	All	800	120
Ann.Inst.of Physics	8	8	16	17
Blackwell	23	23	355	55
Ann. of Civil Engg.	8	8	30	20
Ann. of Chem. soc.	28	All	41	31
John Wiley	28	All	374	84
Cambrige Univ.	11	11	74	18
Oxford Univ.	15	All	69	28
Am. Soc.Mech.Eng.	6	6	20	19
Royal Soc. Chem.	18	All	37	22
Total			3,316	813

was constituted with NISCAIR as the focal point.

ICMR e-journal consortium

JCCC is J-Gate Custom Content (JCC) for a group of homogeneous consortia members. The JCCC-ICMR is an extension of JCC, for the Indian Council of Medical Research (ICMR). It covers 864 journals received collectively at 28 institutions/centres of ICMR. In addition to these, around 264 open access journals are also covered. In all, journals from 486 publishers are covered on a single platform with the following objectives (Table 3).

- To provide a common gateway to e-journals for the participating members of the consortium

Table 3. ICMR Journal Consortium Subscribed e-journals

Publisher	Subscribing Inst	No. of Inst. for e-access	No. of Journal for access	No. of Subscribed journals
Am. Soc. Microbiology	24	All	Jccc e-journal	21
Annual review BMSuite	24	All	Jccc e-journal	20
Science Direct	24	All	Jccc 693	20

- To provide a common access and search interface for all journals subscribed by the consortium members
- To provide an insured and dependable journal archive source for the consortium members

Significance of JCCC-ICMR

- Common access to Table of Content (TOC) and full-text articles for 1,128 Journals
- Common TOC and Database search facility for both print and online journals, which have scholarly content and are subscribed by the consortium members

- Links to abstracts of articles
- Links to full-text articles from JCCC interface
- Facility to search bibliographic database of articles
- Content is mirrored in the server of each participating consortia member
- Links to the journals subscribed by each participating consortia member
- E-mail request for photocopies can be sent from one consortia member to the other

ICAR Consortium for e-resources in Agriculture (CeRA)

Agriculture research, the back bone of agriculture growth in the country, demands timely dissemination of scientific knowledge. Since ICAR is having network connectivity across the institutes and state agricultural universities select journals could be made available over the network for the use of scientific community. Keeping these broad objectives in mind ICAR of late developed e-journal consortium. The nodal institute for hosting this consortium is IARI. In 2008 the NAIP (National Agriculture Innovation Project) has funded for establishing consortium for e-resources in agriculture (CeRA) at IARI of 2000 plus e-journals for full access by 123 initially participating members (Table 4).

Table 4. ICAR Journal Consortium Subscribed e-journals

Publisher	No. of Subscribing Inst	No. of Inst. for e-access	No. of Journal for access	No. of Subscribed journals
Springer	123	All	1190	1400
Annual Review	123	All	22	
Open J Gate	123	All	613	
CSIRO	123	All	08	
Elsevier	123	All	518	
Tyler & Francis	123	All	1500	

Digitization

Conversion of any fixed or analogue media, such as books, journal articles, photos, and paintings, microforms into electronic form through scanning, sampling or in fact even reproducing is called digitization. To digitize the library document following approaches has been followed by ICAR, ICMR and CSIR institutes libraries for their digitization project with in the available funds.

- Retrospective conversion of library collection
- Digitization of a particular special collection or a portion of one
- Highlight a diverse collection
- High use materials

With the advent of newer techniques of digitization, storage and communication, CSIR (NISCAIR) has taken initiation to setting up of the National Digital Library (NSDL). It provides internet access to digital resources of science and technology

throughout the country in particular for the student community in remote areas, facilitating a small level of access to information as is available in metro cities.

Institutional Digital Repositories

Over more than a decade cyber technology has transformed the research communication infrastructure of multiple fields of science and technology and plays an increasingly prominent role in a unified set of global resources. Just a few years ago, many CSIR, ICAR and ICMR libraries were acting on a vision of repositories focused on pre-prints and post-prints of scientific publications and theses and dissertations. Twenty-first century libraries now require introducing new kinds of services to manage all sorts of unique content that have enduring value added service. Impact of contemporary technology forced them to increase the dissemination and also eagerly awaiting to know about the impact of their research. At the same time, digitization programs in these libraries were producing collections of modest numbers of files.

Workshop on open access and institutional repositories organized by MS Swaminathan Research Foundation, Chennai (2004) and a special session on open access journals held at the 93rd Indian Science Congress (2006) suggested to setup institutional open access and digital repositories archives. It reflects on ICAR, ICMR and CSIR to form a consortium on E-journals. These organizations have taken many efforts to create repository services revealed a further wealth of content that potentially requires stewardship.

The CSIR-NISCAIR Online Periodicals Repository program takes the innovative approach of organizing the dissemination of journal article using a publishing model. Working with this model, CSIR Libraries have developed services that meet the open access full text articles from research journals published by NISCAIR. Presently full text open access facility is provided for 15 journals, viz IJBB, IJC-A, IJC-B, IJPAP, JSIR, IJRSP, IJCT, IJEMS, IJMS, IJEB, IJBT, IJFTR, NPR, JIPR, BVAAP and ALIS. CSIR proposed multi-institutional mandate to ensure that previous volumes of these journal articles are archived through OA Eprint Archives project. Each CSIR laboratory sets up its own interoperable institutional open access repository to increase the dissemination and impact of their research.

The ICAR and its institutes are rapidly increasing their digital library and Institutional repositories. The traditional libraries are now on their way to digitization in a phased manner. The number of Indian repositories registered in Directory of Open Access Repository is 37 of Open Access Repository, University of Southampton, UK. The repository of ICRISAT is the sole agricultural open access digital institutional repository in the country through based on the information initiatives presented in the OpenDOAR.

To digitize important institutional repositories (limited to IARI (6,023 items), IVRI, Izatnagar, Bareilly, ANGRAU, Hyderabad and UAS, Bangalore) including rare books and old journals and make them open access under NARS. Some of them (CMFRI, CIFE etc.) are in the process of digitization of institutes' publication, rare volumes published from India during 18th century and valuable documents. Besides the ICAR

institutes libraries most of the Agricultural Universities have taken steps to strengthening of digital library and information management under NARS (e-GRANTH). Krishi Prabha is a full-text electronic database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 45 State/Deemed Agricultural Universities during 1.1.2000 to 31.12.2006. This database, listing about 10,500 Dissertations, has been created by Nehru Library, Ch Charan Singh Haryana Agricultural University, Hisar with financial support from Indian Council of Agricultural Research, New Delhi under its National Agricultural Innovation Project.

ICAR has taken a welcoming effort in bringing e-resources to scientists under CeRA but, it has not addressed the very important thing of making an effort to transform Indian agricultural journals into Open Access Journals and creation of Open Archive Institutional Repositories which is very needed for the acceleration of the Indian Agricultural Research and Scientific Information dissemination and archiving.

The most important organization for medical researching activities in India, the Indian Council of Medical Research (ICMR) increasing amounts of research outputs on medical science publications in print as well as in digital form; collecting and preserving those literature serves multiple purposes; further many of the Indian papers are unable to access, developing an Institutional Repository is the only solution to access and dissemination globally. The council has funded to some institutes to bring out Indian publications through specific subject repository. For example, Institutional Repository of Tuberculosis Research Centre and Digital Knowledge Repository of Central Drug Research Institute (DKR@CDRI) started to provide open access repositories.

ICMR and NIC have developed a bibliographic database of full text archive for 28 peer reviewed Indian Biomedical journals indexed in IndMED (<http://medind.nic.in/>). This subject repository includes materials in all areas of medicine; including biomedical, medical informatics, dentistry, nursing and pharmaceutical sciences. The site includes material published going back over 50 years. The major objective of OpenMED is to provide a free facility to authors to self-archive their publications. This will enable world wide open access to their publication and improve their impact.

Issues and challenges

During the course of ensuring years, these institutes have to face the under mentioned challenges in the wake of digital era.

- Duplication of work was a major problem that reduced the total output
- Quality of metadata
- Indian language content
- Lack of digitization policy
- Non availability of well trained personnel
- Lack of proper preservation policy
- No IPR policy
- Lack of knowledge on copy right acts etc.

The experience of ICAR, ICMR and CSIR institutes' traditional libraries has changed in the first stage of automation, the library could stand alone. In the second stage the

library became reliant on computer networking strategies and the third stage the library is critically dependent on both local and wide area networks. In the networked information revolutions, the libraries not only offer their own network based services but also are becoming increasingly involved in the management and organization of external activities in the network. In a developing country like India, the institutional digital open access consortium is the most practical solution. A national consortium would greatly reduce duplication of efforts and provide greater purchasing power. CSIR, ICAR and ICMR consortia have to take initiation in future to give open access to journals, databases, patents and other rare documents. Digital repository technology has raised the hopes and the expectations of people. The library professionals has faced the issues and challenges of digitization of old document, high cost of journals, licensing copyright, uninterrupted online access, perpetual access to back issues etc these are all bridging the gap between the information and digital technology.

REFERENCES

- Kalpna Dasgupta. 2005. Digitization, sustainability and access in the Indian context. www.ifla.org/IV/ifla71/papers/132e-Dasgupta.pdf (Accessed on 28th February 2009)
- Sreekumar M G and Sunitha T. 2005. Library capacity building through E-Journal Consortia: The Indian Scenario. MANLIBNET 2005. pp. 55-63.
- Pramod Sankar K, Vamshi Ambati, Lakshmi Pratha, Jawahar C V. 2006. In: Proceedings of 7th IAPR Workshop on Document Analysis Systems (DAS), 2006, Nelson, New Zealand, LNCS Springer-Verlag, 425-436
- Vyas S D. 1997. Library Automation and Networking in India: Problems and Prospects. World Libraries, 8(1) (http://www.worlib.org/vol08no1/vyas_v08n1.shtml) (Accessed on 28.2.2009)
- Shukla P and Singh P A. 2009. Open Access initiatives for Agricultural Information transfer system in India. World Library and Information Congress: 75th Ifla General Conference and Council 23-27 August 2009, Milan, Italy <http://www.ifla.org/annual-conference/ifla75/index.htm> (Accessed on 23.7.2009)
- The Directory of Open Access Repositories - OpenDOAR <http://www.opendoar.org/> (Accessed on 23.7.2009)
- NISCAIR Online Periodical Repository. <http://nopr.niscair.res.in/handle/123456789/43> (Accessed on 23.7.2009)