RESOURCE SHARING AND NETWORKING INITIATIVES IN INDIA: A HISTORICAL STUDY WITH SPECIAL REFERENCE TO WEST BENGAL

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Abstract : Due to uncontrolled proliferation of publications in various formats along with financial crunch have compelled the libraries to opt for alternative measures like resource sharing, collaborative procurement, etc. to survive and to satisfy its patrons. India is not an exception to this rule. This paper deals with the historical development of the initiatives taken by the Government to ensure resource sharing and networking in the country and at the same time tries to assess the current situation of the Universities and Research Institutes in West Bengal. Usage of modern tools and technique by the institutes has been studied to find out the success of online resource sharing and essential services. Moreover, best practices and Government policies for the coming days have been studied in this paper. This study is mainly focused on the online Resource Sharing and Networking, Inter Library Loan and collaboration initiatives in the country along with the other initiatives to provide digital resources or study materials irrespective of educational standards to foster lifelong education.

Keywords: Resource sharing, Library networking, Library best practices, Consortia, Educational institutes in West Bengal

1.0 Introduction

Since independence, India has decided to use ICT as a major vehicle for all round socio-economic development in the country. Policy makers' have great faith on ICT and belief that this is the only way out to eradicate all social challenges. Jawaharalal Nehru, India's first Prime Minister, was not an exception of this belief and declared that *"science alone...could solve these problems of hunger and poverty"*. After continuing this ICT initiative for a long time, Manmohan Singh, the Prime Minister of India realised the dark side too and opined in 2004 that *"the greatest challenge facing [India] is to make high technology work for the poor"*. Complete dependence on digitisation and online access to information in the third world country like India inevitably widen the gap between people who have access to internet and those that do not. To eliminate this digital divide, Govt. of India has already taken huge initiatives along with the provision of life long learning in the country. Moreover, significant initiatives have been taken to establish the Institutional Repositories (IR), Consortia, National Repository, National Union Catalogue along with the development of Library Management Software, national cloud, etc.

2.0 Literature Review

After independence, the Government of India took several initiatives to **improve the library services** in India. The Imperial Library, Calcutta, was renamed as National Library of India in 1948, UNESCO sponsored Delhi Public Libraries was established in 1951, Indian National Scientific Documentation Centre (INSDOC) was established in 1952, financial assistance was given to the state governments under the "Scheme of Improvement of Library Services" to set up State Central Libraries and District Libraries during the First and Second Five Year Plan, in 1954 Government of India enacted the Delivery of Books (Public Libraries) Act and was amended in 1956 to include newspaper too. In 1956 the University Grants Commission of India (UGC India) was set up by the Indian Union

government in accordance to the UGC Act 1956 under Ministry of Human Resource Development, and is charged with coordination, determination and maintenance of standards of higher education. It provides recognition to universities in India and disburses funds to such recognised universities and colleges.

Moreover, need for cooperation was realised since independence and hierarchical system was proposed by S.R.Ranganathan for proper implementation of library services, in every corner of the country, considering several regional languages and to improve the literacy among common people and the initiatives of Indian library network was evident to the efforts made since 1950s. The 1958 Scientific Policy Resolution, adopted as the instance of Pundit Jawaharlal Nehru, emphasized the fostering of scientific temper in people. In pursuance of this agenda, several committees and commissions were appointed to look into specific issues and come up with necessary recommendations viz., Sinha Committee's Report (1959), Ranganathan Report to UGC (1965), Peter Lazer Report and V. A. Kamath Report (1972).

There were some major changes took place globally, in the field of library and information services during the 1960s and 1970s due to the advances of Information Technology (IT). But, proliferation of available documents and escalating prices of journals impose severe pressure to procure documents from this period. IT has proved to be the decisive factor in the modern library services, in India and other countries. Amalgamation and merger concept were started along with the on-line database searching, online resource sharing, etc. during this period to provide maximum access of documents with minimum financial budget.

Keeping in pace with developed countries, during 1970s Government of India took several explicit commitments for the adoption of most desired national library policy. In 1972 Raja Rammohun Roy Library Foundation (RRRLF) was established as an autonomous organisation under the Department of Culture, Government of India. The National Information System for Science and Technology (NISSAT) was established in 1977 and as library services in India began to expand rapidly, Professor R. K. Das Gupta, Director, National Library, Calcutta and Chairman, Raja Rammohun Roy Library Foundation recommended the Government of India in favour of enunciating a National Policy for Library and Information Systems.

The Seventh Five Year Plan (1985- 1990) had provided for the promotion of library and information services and the introduction of information technology. As such in the Report of the Steering Group on Science, Technology and Environment recommendations were made for the transformation of libraries and library community through the use of computers. It was advocated that most of the major library operations should be computerised during the Seventh Plan. As a result of these recommendations the Planning Commission set up a 'Working Group on Modernisation of Library Service and Informatics' under the chairmanship of Dr. N. Seshagiri in 1984 and this committee had proposed the development of a computer network, linking all special libraries in India by the year 2000 and modernisation of libraries with computers, facsimile transmission, video-disc, computer aided micro-filming and reprographic facilities.

Moreover, the 'Committee on *National Policy on Library and Information System* (CONPOLIS)' in its draft submitted in 1986 recommended several initiatives including the use of information technology on a nation level.

Based on all these proposals and recommendations, **NISSAT** had initiated the establishment of CALIBNET in 1986, DELNET in 1988, PUNENET in 1992, ADINET in 1993, MYLIBNET in 1994, BONET in 1994 and BALNET in 1995. On the other hand, **UGC** had established INFLIBNET in 1988 and **INSDOC** promoted MALIBNET in 1993.

Government of India formed the IT Task Force in 1998. This task force perceived ICT "as an agent of transformation of every facet of human life which will bring about a knowledge-based society in the twenty-first century" (IT Task Force, 1998). Earlier, the Electronics Policy (1985) noted that "the software content of electronics is increasing and India is most appropriately placed to take advantage of this".
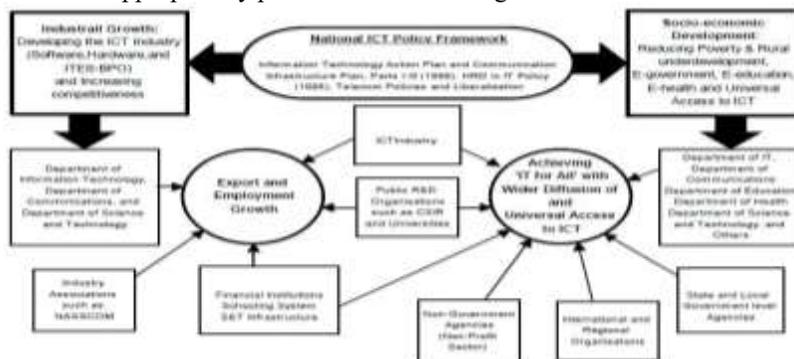

Figure 1: ICT Innovation System in India (Baskaran and Muchie, 2006)

Several other initiatives have been taken by the Government since the beginning of new millennium (year 2000) to prepare the vision document intended for the development of the library services in India. Among these, National Knowledge Commission (NKC) was constituted in 2005 is considered very significant. Apart this, National Education Policy (2016) of Government of India and "Roadmap & Vision Document 2020...2030" submitted by the West Bengal Education Commission in 2015 are the most substantial initiatives to prepare a roadmap for the coming days.

From the literature review it has been found that cooperation is the only way out to the libraries to sustain in this information era. H K Kaul (2002) opined that, "the necessity of networking of libraries in India was strongly felt in the 1980s as the developed countries had advanced a great deal in this field and had considerably gained through resource sharing and networking." So, external force was the main reason to implement resource sharing and networking in the country. As a result, in the 1980s organised efforts were made to collect and disseminate information. The 1983 Technology Policy Statement emphasised the need for a technology information base.

On the other hand, Sridhar, 1995 elaborately described the implementation problems of resource sharing and networking in India in its preliminary stage. According to him *"it is everybody's knowledge that resource sharing is most talked and least acted area in librarianship. Several idealistic theoretical slogans have been repeated again and again and many master plans have remained on paper in the custody of planners. These grand ideas and plans are threatening individual libraries that if they do not act they are going to starve and die in the information drought. Even after hearing about the benefits of cooperation and resource sharing egoistic, suspicious and lax attitude on the part of people at helm of affairs have not yet been overcome. Nobody is worried about this widening gap between plans and practice of resource sharing".*

It has also been identified from the literature review that "the most important developments for academic libraries during the late 20th century is the move from organizational self-sufficiency to a collaborative survival move supported by the growth of library consortia. With the emergence of consortium concept, the libraries in developing countries like India are at the verge of self-sufficiency by endowing with electronic resources at deeply discounted prices. Since the year 2003 major initiatives were observed for the creation of consortium in India. (Tripathi, 2013).

3.0 Methodology

As it is a historical study, so Desk Research has been done to analyse all the varied literature and to make the conclusion. All the historical information and data have been collected from the already published literature through literature review and from the consultation and communication with the subject experts. Review of expert committee recommendations, study of Government initiatives and policies have been done to collect data on existing situation, best practices, roadmap for the future and also to find the gap that hinders the proper implementation of Government initiatives. Moreover, study of the webpages of each and every University and selective Research Institutes situated in West Bengal have been done to find out the nature of services, cooperation among libraries, mission and vision of the respective institute and other essential factors related to inter library loan, networking, consortia initiatives, etc.

All the present Universities of West Bengal have been taken in the purview of investigation to identify their resource sharing initiatives and online services to eliminate the gap as far as possible. So, the whole population is the sample. List of Universities have been taken from the Website of Higher Education, Government of West Bengal but research institutes have been selected purposively as listed in Wikipedia based on their importance. So, in case of research institutes convenient sampling method has been adopted.

4.0 Gradual development of resource sharing and networking in India

Initially resource sharing was started with inter-library loan of hard copies of the document. At that time creation of bibliographic database was very popular and these databases were distributed in various forms and formats among the other libraries. After the invention of Internet, whole scenario has been changed. Rapid development of Information Technology considered as blessings specially to manage the repetitive works efficiently but at the same time opens the door for rapid proliferation of published works, beyond the capacity to manage by an individual library. Although the Information Technology has come up with its solutions too, in the form of online and automated resource sharing, software as system, etc. Cloud computing added the networking benefits at its maximum. Compatible format of documents to share and increased speed of internet are the basics of modern resource sharing. In fact, in these days, resource sharing includes everything starting from documents, staff, building, almost everything that a library need to exist. Three distinct modernisation phases have been identified in Indian towards achieving computerisation, networking and building cooperation among the libraries. These are as follows:

- Since independence to 1970s: several policies have been taken, tried for infrastructure development through the establishment of NUCSSI, NISSAT, and UGC and considered as the period of networking initiatives in India

- 1980s and 1990s: witnessed actual implementation of several recommendations taken in earlier period and able to establish networking and resource sharing among libraries. During this period Metropolitan Library Network, Data Network and National Level Network instantiates were implemented (CALIBNET, DELNET, INFLIBNET, etc.) and

- Since the year 2000 to till date: several networking and resource sharing initiatives have been taken in India. Moreover, IR and Consortia have been setup along with the help of rapid advancements in the Internet, networking and Cloud computing. Central Govt. and State Govt. both have shared their responsibilities to support the advancement of online Library Services in the country.

5.0 Digital initiatives

During 1980s and 1990s, NUCSSI, NISSAT, and UGC tried its best for the establishment of several bibliographic databases, software, and library networks either national level or regional one. Among the Data Networks NICNET, INDONET and I-NET is very significant. Specialised Metropolitan Library Network like CALIBNET, BONET, DELNET, ADINET and MYLIBNET were setup during this time. Beside these DESINET, ERNET, SIRNET, VIDYANET, BTISNET, INFLIBNET, BALNET and MALIBNET were evolved as specialised countrywide library networks. Moreover, several initiatives were taken during this time to bridging the digital divide in the country and e-learning. But at that time internet was in the developing stage in India. VSNL was the sole connectivity provider. Due to these reasons internet was within the reach of few general people and connection speed was very slow. Networking and large file sharing was not possible at that time with the help of internet. So, access of CD-ROM databases was the only solution.

Indian initiatives to build resource sharing network using the consortia model was initiated in the beginning of 2000 AD. Some of the important initiatives are as follows:
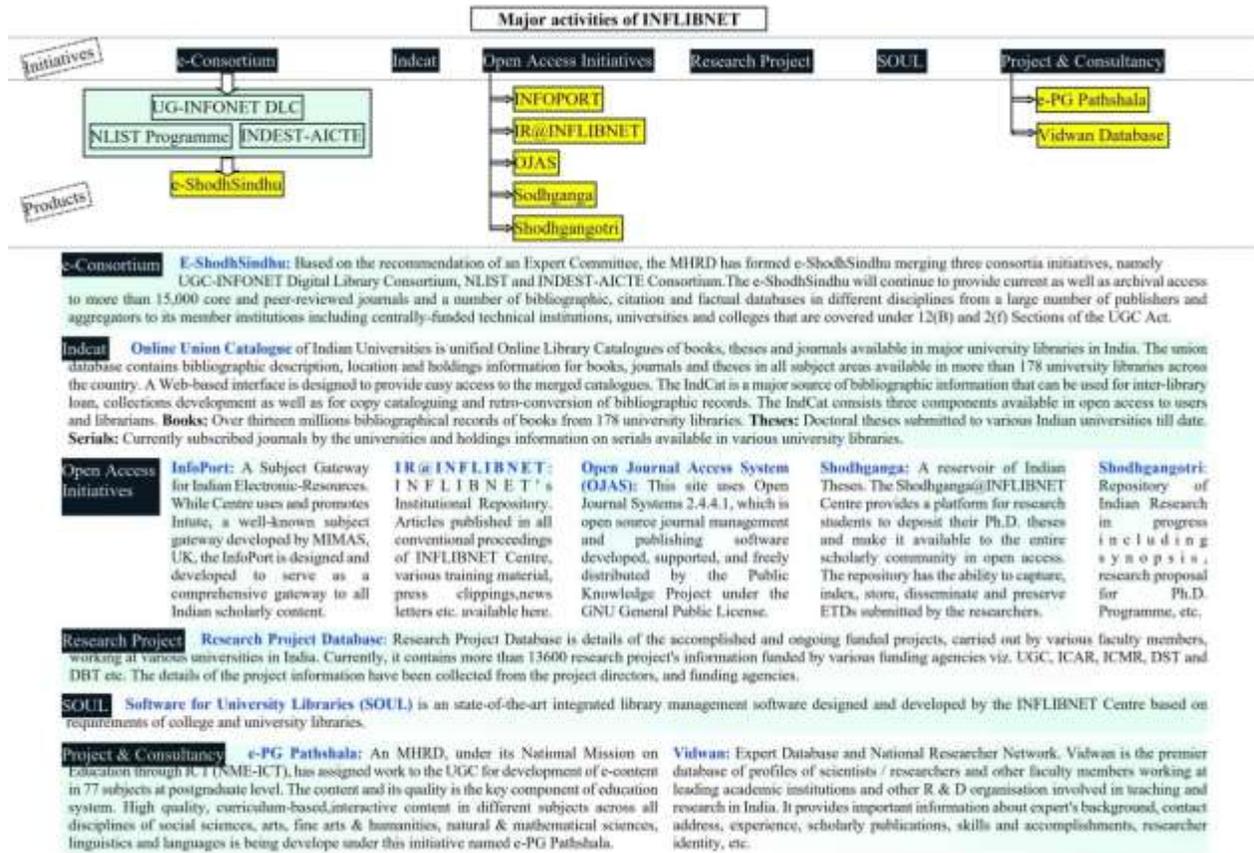
Table 1: Consortia initiatives in India

INDEST-AICTE Consortium	http://icolc.net/consortia/176
e-ShodhSindhu	https://www.inflibnet.ac.in/ess/
ERMED Consortium	http://www.ermed.in/
UGC DAE Consortium for Scientific Research: Kolkata Centre	http://www.csr.res.in/csr_kolkatta.html
HELINET Consortium	http://www.rguhs.ac.in/digitallibrary/Helinet%20about%20us.html
IIM Libraries Consortium	http://library.iima.ac.in/iimconsortium/introduction.php
National Knowledge Resource Consortium (NKRC)	http://nkrc.niscair.res.in/
Developing Library Network (DELNET)	http://delnet.nic.in/
Ministry of Communications and Information Technology (MCIT) Consortium	https://www.india.gov.in/official-website-mcit-library-consortium
Indian Council of Medical Research (ICMR) e-Consortia	https://icmr.nic.in/icmrnews/e_consortia.htm
N-LIST	http://nlist.inflibnet.ac.in/
DRDO EJLS consortium	http://dsl.drdo.gov.in/ejournals/home.html
UGC-DAE Consortium for Scientific Research	http://www.csr.res.in/
Forum for Resource Sharing in Astronomy and Astrophysics (FORSA)	http://www.rri.res.in/htmls/library/forsa.html
icici Knowledge Park Consortium	http://www.ikpknowledgepark.com/
J-Gate@Consortia	https://jgateplus.com/home/j-gate-consortia/
Consortium for e-Resources in Agriculture (CeRA)	http://cera.iari.res.in/index.php/en/
National Open Distance Learners' Library and Information Network (NODLINET)	http://www.ignou.ac.in/ignou/aboutignou/division/ldd/Nodlinet/AN
ISRO Library Consortium (Antariksh Gyaan)	http://14.139.110.237/AE/

6.0 Initiatives taken by INFLIBNET

Among all the initiatives taken in India, INFLIBNET's role is most significant due to its vastness and relevant measures compared to modern services.

Table 2: Initiatives of INFLIBNET

7.0 Digital Library and Z39.50 initiatives

India has taken several initiatives to keep the libraries relevant, for providing online access of e-documents to support the need of researchers, students, faculty members and common people to foster lifelong learning and also to support distance education and to preserve the national heritage. Digital Library initiatives were started with the Million Book Project. All the content created through this project were uploaded to the Digital Library of India portal. But this was discontinued in the year 2017 but National Digital Library was started its journey under the guidance of IIT, Kharagpur. At present there are 123 repositories registered to Registry of Open Access Repositories and NMEICT has able to setup its own Z39.50 server using KOHA has the host connection reliability of 100%.

7.1 Software initiatives in India

Table 3: Library Management Software initiatives

Software name	Developer/ initiatives taken by
Suchika	DRDO
TRISHNA was developed using CDS/ISIS (Ver. 2.3)	- NISTADS, New Delhi
Sanjay was developed based on CDS/ISIS capabilities through the PASCAL interface	Developed by DESIDOC and marketed by NISSAT
Maitrayee	Developed for CALIBNET project by the CMC Ltd.
Request and Soochi	BONET
DELPLUS and DELMARC	DELNET
GRANTHALAYA	INSDOC
SOUL 1.0 & SOUL Network Version 1.0 & 2.0	INFLIBNET

e-Granthalaya	NIC

SOUL, DEL PLUS and e-Granthalaya Library Automation Software were developed by INFLIBNET, DELNET and NIC respectively to support day to day need of the libraries. But none of this software meet the modern requirements to support Inter Library Loan, Licence Management and to support discovery services. Although several other software is being used by the higher educational institutes and universities. Direct Online Copy Cataloguing with the help of IndCat is supported by SOUL 2.0 Software but it does not support cloud hosting. Software as a system is yet to implemented in India including automated Inter Library Loan (ILL).

7.2 Union Catalogue initiatives
Indian Union Catalogue initiatives have been limited to the Universities only. Till date only 176 Indian Universities have uploaded partial contents of books record; 315 universities have provided thesis and 223 Universities have shared serials data with Online Union Catalogue of Indian Universities (IndCat).

Initiative of State Union Catalogue was also taken by INFLIBNET in Gujarat (Online Union Catalogue of Gujarat Colleges/ Institutes/ Universities popularly known as GujCat: Online Union Catalogue of Gujarat). Separate database maintained for the States of North Eastern Regions and known as NERCat.

7.3 Creation of educational portal to support lifelong learning
Significant initiative taken by the Government of India for the betterment and up-gradation of higher education including educational portal, shown in the following table:

Table 4: Education Portal initiatives in India

Govt. of India initiatives	MHRD, Govt. of India funded projects
• National Knowledge Commission (NKC) • The National Mission on Education through Information and Communication Technologies (NMEICT) • University Grants Commission (UGC) • National Assessment and Accreditation Council (NAAC) • New Education Policy 2016 • Rashtriya Uchchatar Shiksha Abhiyan (RUSA) • All India Survey on Higher Education (AISHE) • NITI Aayog • The National Institutional Ranking Framework (NIRF) • National Academic Depository (NAD) • Swayam prabha • SWAYAM	• e- PG Pathshala • NPTEL Engineering Media Content • Virtual Labs • Talk to a Teacher and A-View Virtual Classrooms • Spoken Tutorial • CEC • E-Yantra • Digital Library INFLIBNET • Quantum & Nano Computing • ERP Mission (Initiatives of MHRD through NMEICT) • ISLERS • Oscar++ • Fossee • E-Kalpa • Pedagogy Project • Virtual Learning Environment • Text Transcription • Aakash Educational Portal • OSS for Maths Edu. • SOS Tools

7.4 Meghraj, the National cloud initiatives of India
This is the NIC's Cloud Services which offers variety of service model to meet all requirements like:
a) Platform as a Service (PaaS)
b) Infrastructure as a Service (IaaS)
c) Software as a Services (SaaS) and
d) Storage as a Service (STaaS)

7.5 West Bengal at a glance

Category	Number of Universities
State-aided Universities	20
State Specialised Universities	6
Deemed University	1
Central Universities and Institutes of Higher Learning	8
Private Universities	9
Open University	1
Total	**45**

Table 5: Universities in West Bengal and categories

Among these 45 universities, only 14 have able to provide either web-OPAC and or repositories. One university has no functional websites at all. Majority of the universities fail implement federated searching and discovery services. And only one university has able to implement Electronic Resource Management. 13 Research institute websites have been studied and most of them are still trying to implement modern web-based library services. None of them are at per with the libraries of developed countries. Although, IIT Kharagpur has taken the responsibility of National Digital Library but automated Inter Library Loan (ILL), proper rules for ILL or payment gateways are yet to be implemented by the libraries in West Bengal. In some cases inter-institutional ILL services have been found.

8.0 Recent Government policy

National Knowledge Commission (2005) charged with considering policies that might sharpen India's comparative advantage in the knowledge-intensive service sectors. NKC recommend several reforms of the education sector, research labs, and for the libraries. But most of the recommendations were almost same as those constituted earlier. Progress of the Indian education system have been reflected in the National Education Policy, 2016 where in its draft the Committee confessed that the earlier policies on education in India have not been fully realised and implemented although that policies have clear objectives and goals. So, India has achieved very little so many years after independence. But it is very strange that the draft NEP 2016 has not proposed any concrete steps for the development of libraries to support Higher Education and Research in India. The final report of "West Bengal Education Commission Roadmap & Vision Document 2020... 2030" has already been submitted to the Government of West Bengal on 17th August, 2015 is very important as it has proposed several recommendations for the libraries. The National Assessment and Accreditation Council (NAAC) is an organisation that assesses and accredits higher education Institutions in India. It is an autonomous body funded by University Grants Commission of Government of India has recommended distinct best practices for the libraries in India. This is first of its kind but NAAC has not tried to upgrade it based on the recent trends.

BEST PRACTICES SET BY THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC)

"The global changes particularly the Information and Communication Technologies (ICT) have impact on the functioning of academic libraries. The developments in ICT have changed the users' expectation from the academic libraries in different ways. The ways to build collection and services to the end users vary from the recent past practices. To meet the end-users demands effectively, the academic libraries need to identify and adopt good practices and benchmarks. Thus, preparing guidelines in a standardized way based on the best practices employed by libraries is significant which will ultimately enhance the value based services of academic libraries".

Management and Administration of Library:
- In -service program
- Staff promotional practice
- Maintenance of service areas
- Special deposits scheme
- Resource generation (through external membership)
- Resource generation (through internet service)
- Student internship programme
- Student participative programme
- Earn while learn programme
- Library science as optional course/paper

Extent of the Use of Services
- User Education (Information literacy programme)
- Initiation to fresher (Information Literacy Program)
- Preparatory course for students' projects (Information literacy programme)
- User orientation (Information literacy programme)
- Information aids (Information literacy programme)
- Library use statistics
- Library best user award
- User feedback practice through different formats
- User Feedback Practice thru suggestion boxes

Use of Information Technology in Libraries
- On-line information retrieval (Internet access facility)
- Free browsing Unit (Internet access facility)
- Broad band Internet Center (Internet access facility)
- Library homepage for Information dissemination
- Dynamic Library Website
- User feedback through library homepage
- 24/7 Access to e-resources
- Access to Digital repository through library website.
- Digital access to all internal documents
- Digital repositories
- CD NET server facility
- Digitization of manuscripts
- Web OPAC
- Campus-wide local area network (LAN) facility
- Database creation using international standard formats
- Electronic surveillance system

Collection and Services
- Compact storage of less used collection
- Collection development in different formats
- Library book exhibition
- Extended library opening hours
- Extended hours of service
- Collection enhancement in hybrid library

Retrieved from: http://www.naac.gov.in/docs/Guidelines-Colleges-Library.pdf on 4.4.2018

9.0 Findings

From the literature review and instances like OCLC, it has been identified that open architecture systems gaining popularity in the field of library and information science for the last few years to enhance access by exposing library data through web protocols as it opens endless options. This increased portability has further encouraged libraries to develop in-house discovery interfaces to blend traditional MARC-born data with non-MARC metadata, merging traditional library resources with digital collections, institutional repositories, and research data sets. Side by side, some cloud-based Integrated Library Systems have been introduced to support discovery, ingest MARC and non-MARC metadata, which are capable of allowing libraries to manage multiple types of data in a single interface. The most promising aspect of this architecture is the ability to crosswalk library data into linked data formats that search engines can able to ingest easily and index perfectly. New search engine optimized (SEO) search tools are very powerful to provide access of the library resources at the search engine level. This will definitely bring the users back to the libraries. Development of new bibliographic framework, focused on compatibility with linked data standards, will enhance both searches engine optimization and semantic searching. So, all these new initiatives have to be included in by the NAAC in its Best Practices norms for the Indian Universities and all other institutes. On best example and model may be the initiatives taken by the OCLC.

Among all the consortia initiatives e-ShodhSindhu (merger of N-LIST & INDEST-AICTE Consortium) is very significant. It is maintained by INFLIBNET and majority of Indian higher educational institute subscribe e-journals and e-books through it. Although, individual subscription by the universities and institutions are still being practiced.

Ministry of Electronics & Information Technology, Government of India took several initiatives to strengthen the networking, to provide technological support and internet solution by setting up NIC, C-DAC, ERNET, etc. National Cloud, MeghRaj has been developed along with National Knowledge Network which is capable to interconnect all the Government institutes and store data centrally. Ministry of Human Resource Development, Government of India and UGC have also taken several initiatives for man power development, providing e-document, study materials to each and every people in India. Under the NMEICT project several initiatives have been taken so far.

The jurisdiction of West Bengal is very large. So, internet connectivity is the only solution to build a network among all the higher educational institutes, research centres and universities. There are so many colleges within this area. Now-a-days, as research is being conducted in the colleges so they must be interlinked with its mother university. From the website study it has been clear that none of the university and research centre in West Bengal is able to offer proper information support to its patrons. Moreover, they are isolated and trying to satisfy its patrons of its own. Initiatives for cooperative collection building, copy cataloguing, inter library loan among the libraries of Greater Kolkata is either negligible or absent. Moreover, information services through its website is very poor. In some cases, websites are poorly arranged, without separate space for the libraries. User education initiative, option for book suggestion by the patron, current awareness service, electronic resource management, discovery service in OPAC is almost absent. Single window services through the website is still dream for all educational and research institutes in Greater Kolkata.

So, it is very clear that there are so many parallel initiatives have been taken in the country to achieve the same goal. This is just the duplication of efforts in terms of money, manpower and time. Considering the success of OCLC system, without the geographical and language barrier, that would be the best possible option available to achieve the cooperation and resource sharing among all the learning institutes not only in a particular region like Greater Kolkata but for the whole country.

It has also been found that no proper data capture initiatives for the individual libraries and librarians have taken by the AISHE and still there are lots of recognised institutes which has no library facility (according to AISHE, 2016-17 data) is a major concern for overall development of higher education. Moreover, budget allocation for the up-gradation of the under developed Universities or Institute has not found.

10.0 Further studies

Universities and research institutes of only one state (i.e. West Bengal) has been studied. Universities and research institutes of other states of India and Union Territories to be studied for a complete result regarding the advancement and initiatives taken to provide online service, resource sharing and level of cooperation among the institutes.

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