Impact of Digital Technology on Library Resource Sharing: Revisiting LABELNET in the Digital Age

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Introduction

Resource-sharing whether formal or informal, is a common practice in libraries across the globe. The concept vaguely started in late 18th century with the founding of American Library Association (1876) and slowly gained momentum in the coming decades. It started from shared cataloging, resulting into OCLC (1967). Then in mid 70's, the exponential growth in number of publications and the shrinking library budgets due to financial crisis, gave way to the concept of Cooperative Collection Development and initiatives like Research Libraries Group (RLG) appeared. This led to formation of Library Networks, Forums and consortia at all levels and helped development of the infrastructure for resource-sharing by introducing the development of Union catalogs, union lists of serials and refining and formalizing the Inter-library Loan Systems (ILLs) widening them to state-wide and International levels and introduced concepts like shared access to library members.

Although some discussions in the Library Science literature, also include sharing of human and computer resources, but mainly definition of resource-sharing typically involves sharing of the information resources collected by libraries and conditionally made available to users not a part of the owning library's clientele. Traditionally, the activity was based on the following three functions (Shreeves, 1997):

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1. Bibliographic Access --- that is knowledge of what is available for sharing from other libraries through such means as union catalogs, etc.

2. System for making requests and providing document delivery of information, such as Inter-Library Loans- ILL , through mutually agreed terms of cooperation

3. Cooperative collection development to ensure that the libraries develop complementary collection of resources.

Reasons for resource-sharing are as many and as diverse as the articles published on the topic in the literature of Librarianship. But all of them boil down to just three objectives:

1. To avoid duplication of effort involved in the time consuming and laborious jobs of original cataloging and indexing.

2. To solve the financial problems due to continued rise in the prices of information resources.

3. To provide library users, a wider access to information, beyond the limits and limitations of one library.

And till date, one or more of these three objectives underlay all resource-sharing efforts and initiatives.

Components of a Resource-Sharing Network

The infrastructure of a resource-sharing network normally involves establishment of the following components:

A Consortium, Forum or a Cooperative Group of Libraries

Libraries all over the world exist as organizations within other organizations. Whereas the libraries share the professional problems and have similar management and technical systems to run their operations, they are all working under different parent organizations with heterogeneous objectives and contrasting governing systems.

In Pakistan, the condition of governance in general and the situation of bureaucracy in common are a bit too grave. So libraries working in various management systems find it hard to operate in cooperative systems due to the clash of systems.

The willingness and commitment at the institution level, to cooperate with other institutions in library collection development, management, cataloging and in the delivery of services is the first thing in creating any resource-sharing project. This requires formal marketing efforts to create awareness about the virtues of resource-sharing at the higher management level.

Librarians have shared resources for many decades through both formal and informal agreements. Even in Pakistan, each of us librarians has his or her own limited and informal network to borrow books from each other's libraries through personal links. The concept of resource-sharing is not missing among libraries in Pakistan. There exists an un-written code of conduct among librarians of Pakistan, to informally borrow and lend materials to each other in case of urgent needs, which is keeping the resource sharing tradition alive though at a limited level.

So, creating awareness among librarians for realization of need for resource sharing is just an effort to teach the birds how to fly. Awareness is required at the government and institutional higher management level. Library networks require policy support from their institutions in order to operate freely in a Networked environment.

This component requires:

1. *Policy Framework* at the institutional level and commitment of the Institution for supporting their library to enter into cooperation and allowing the librarian to make decisions for cooperative activities including budgetary support.

2. *Formal legal agreements or MoUs* signed by heads of institutions as well as the librarians as a legal undertaking

to keep the policies persistent and keep the management support ongoing and un-interrupted.

3. *The Consortium Administration Committee* This is the main governing body of the consortium comprising of the librarians which is responsible for making technical policies, decides terms of cooperation, creates operational framework of activities makes technical decisions on use of indexing language, bibliographic processing standards, software, database format standards, etc. and makes network management decisions.

System for Cooperative Collection Development

This component basically addresses need to fill the information gaps in the library collections, developed due to financial or other reasons. The various forms of cooperative collection development are;

1. *Subject specialization* where each library in a network undertakes to build a comprehensive and complete collection in one subject area;

2. *Shared purchases* of highly expensive reference or electronic resources and

3. *Journals Titles allotment*

This component has taken a boost due to emergence of current Information Technologies. Internet combined with an increased availability of Online Resources has given rise to a multitude of consortial arrangements. "But the goals of these consortia are forcibly quite different in nature from those that guided cooperative arrangements in the print world" (Pissani, 2002). The print materials in the initial cooperative collection development networks, was purchased and owned by the relevant libraries, which could easily inter-lend within and even out of the Consortium through the traditional ILL Systems. While the electronically produced information, in an electronically connected environment, can be easily "shared" with other institutions, if only

publishers will allow it. "But fear of economic survival has induced publishers to impose restrictions on sharing that have practically eliminated the *fair use* doctrine by which libraries had operated with print publications."

Today, each library in the consortium pays for access but still none becomes owner of the content. The resource sharing consortia are now just acting as buying clubs just to negotiate better terms and to reduce the cost of access.

System for Shared bibliographic Processing

This involves:

1. *Shared cataloging* when all libraries develop a common catalog database which is updated by the first library receiving a new publication. Subsequently other libraries use the same data record.

2. *Cooperative indexing* when multiple libraries of the network receive the same journals and divide the journal titles for indexing and develop a cooperative index for use by all.

This component addresses the time and labor saving needs of the networked libraries. This is the first form of resource-sharing among the library networks. The emergence of commercial indexing firms like UMI and initiatives like OCLC have almost diminished this function from the library networks. But in the countries like Pakistan, where purchase of such facilities for a library is still an un-affordable a luxury and there is no such facility available for indigenously published materials, *shared cataloging* and *cooperative indexing* are still serious options for networked libraries forums.

Systems for Shared Use of Information Resources

Common forms of shared use are:

1. *Inter-Library Loan System* A mutually agreed system of publications loans by the libraries from other libraries for their users.

2. *Shared Memberships* when the users of one library can use their membership card for borrowing materials from any library within the Network.

Both these forms of shared use worked ideally with print materials. Advent of photocopiers, fax machines, scanners and e-mail facilities have added some value and speed to delivery of journals articles over distance. But in the electronic information environment, issues like copyright, ownership versus access, terms and conditions of the license agreements, online access rights control, have rendered these otherwise simple form of resource-sharing, practically too limited to be effectively useful.

Development System for Information-Sharing Tools

First thing for sharing of information is to know what information is available in other libraries. Libraries develop the following tools:

1. *Union Catalogue of publications* is a single centralized database of holdings of multiple libraries, giving the names of libraries where a certain book in the catalog is available along with the spine label information.

2. *Union List of Serial* is a list of journals titles with complete holding information and the names of libraries where the titles / volumes are available.

Union catalogs used to be a single centralized database. But now it may be a distributed database, which is centrally administered and consolidated, or multiple stand-alone databases administered through a user interface to a distributed search system. In any case, it provides users with the ability to perform consistent searching of records from multiple institutions. For this purpose, however, the records must be indexed consistently, there is uniformity in the choice of fields to construct various indexes,

and strict standards of standardization and quality control must be followed during data entry and subject analysis (Kohl, 1997).

Currently, use of computers in library management has increased and creation of computerized catalogue databases is becoming a common practice all over the world. Simple and easy web-publishing tools for creating web-based catalogs are also freely available. The newer software is coming with online web-based update facility. Given some technological considerations like Z39.50 compatibility and other inter-operability issues, creation of Union Catalogs and union lists of serials is now much simpler as compared to the initial efforts.

Library Resource-Sharing Initiatives in Pakistan

As I have mentioned earlier, resource-sharing in a limited and informal way, has always been there in Pakistan. But we are not altogether deprived. Conscious efforts of sharing resources have been done off and on in this area. Following is a detail of some initiatives:

LABELNET (1990 – 1996)

The Lahore Business and Economic Libraries Network, LABELNET established in January 1990, is the first and only example of a formal library resource-sharing network (Bushra, 1990). LABELNET is a sectoral network. It is a consortium of 9 libraries located in Lahore area, specializing in the areas of public and business administration, economics and allied disciplines.

LABELNET has all the components of a formal resource-sharing network. In a bottom-up style, it was initiated by librarians who first decided to collaborate and then reached up to their higher management for support of the initiative. The network is cooperatively administered and governed by a forum named The Lahore Librarians Cooperative Group (LLCG). With a sizable funding from IDRC, Canada, the Network developed:

1. A computerized union catalog database of references to
    books, reports, government documents, theses, etc. on
    Pakistan's business and economy, held by the network
    libraries. Till date this is the most comprehensive
    bibliography of Pakistani books printed on the subject.

2. A computerized union list of serials giving holdings
    information on Journal titles subscribed by network
    libraries.

3. A cooperative Index of Pakistani Periodicals subscribed by
    the Network libraries.

4. A formal system of Inter-Library Loans to share
    information resources

DEVINSA (1985 – 1999)

This regional network project was established to strengthen
national and regional information systems in Asia by developing a
regional network for socioeconomic information for South Asia
(DEVINSA) encompassing Sri Lanka, Pakistan, India, Nepal and
Bangladesh.

The project created a computerized bibliographic data base
of selected published and unpublished socioeconomic literature on
South Asia produced within and outside the region. Supported by
IDRC, Canada, DEVINSA adopted DEVSIS-related standards and
tools, adapted them as necessary to suit local requirements and
trained DEVINSA personnel in their use; and providde a range of
output products and services to planners, administrators,
researchers, etc.

The Development Information Network for South Asia –
DEVINSA was an international network for sharing development
information among the seven SAARC countries. The Network was
based in Colombo, Sri Lanka and was centrally managed by Marga
Institute of Development Studies. In Pakistan, libraries of Pakistan
Institute of Development Economics - PIDE and the Lahore
University of Management Science – LUMS, were the focal points

to collect and process the development related information from Pakistan and send the bibliographic records to the Head quarter at Marga. In return database updates were sent to all member libraries to add to their local databases. Photocopies of the required publications could be requested directly from the library holding that item, for delivery by mail.

NADLIN (1986 – 1993)

The National Documentation Centre Library and Information Network – NADLIN is a project of Pakistan Council of Research in Water Resources (PCRWR), Ministry of Science and Technology, Pakistan. In a top-down style, the network has been established by PCRWR, an autonomous government body basically to address its own research information needs. NADLIN has its own library system and special staff. Other relevant libraries were selected to collaborate and participate in the project. Objectives of the project aspired to build nationwide collection, collation and dissemination of national materials on water resources, establishing a nationwide ILL and to network libraries specializing in water resources in Pakistan.

However, practically the initiative remained limited to development of a centralized bibliographic reference database which could have served as a strong base for developing a resource-sharing network. But the other activities remained almost under-developed and NADLIN remained geared and its services focused towards the needs of its own parent organization. Despite the potential, NADLIN could not expand itself as a full-fledged resource-sharing Network. NADLIN was a focal point for the Environmental Sanitation Information Centre - ENSICNET an international information-sharing network based in AIT, Bangkok

Problems of Offline Networks

All of the above examples are semi-automated offline Networks. All three used computers to develop the tools like union catalogues or the information sharing databases, but the actual

information was on paper and sharing was done through paper-dependent activities of ILL and Document delivery. Distance played a vital role in the success or failure of these initiatives. Despite being very well planned, enthusiastic and sincere, these ambitious initiatives are now either dead or diminished.

Being the planner and project leader of the first, active participant at planning level of the second and a close observer of the third, I can find the following reasons for this phenomenon:

LABETNET being a local city-based network, was more closely knit in terms of communication. The steering committee (LLCG) could meet frequently to make or change decision. Technical issues and administrative problems could be discussed over the telephone. ILL requests could be sent and ILL items could be picked up and dropped back by hand through official messengers, couriers or drivers. In urgent cases, the user was directed to make a trip to the relevant library to consult the information items. Similarly, the union catalog and other databases were up-dated through exchange of data on the diskettes.

But the functional problems were still many and surfaced quite soon. First thing was non-availability of computers in some libraries of the network and so, the level of computer literacy varied among library staff. This was covered through computer donations and training workshops. But soon it was observed that long spells of electricity shut-down was a routine in Lahore during WAPDA load-shedding programs and even the most efficient network could not be run if the computers are off for long hours. So, it was decided that the computer database should be supplemented with a printed catalog which could be consulted during power failure phases. So, the whole database was printed into a 5 volume (6 part) publication entitled "A Union Catalogue of publications on Pakistan's Business and Economy in LABELNET Libraries", and copies were made available to all libraries. A copy of this catalogue is still available in the Library of Congress collection in the form of microfiche.

Despite all efforts, delays and losses in delivery of data and documents could not be helped and caused a lot of frustrations among the librarians as well as the users.

NADLIN was state-wide network and DEVINSA was international. Distance and time became more difficult to manage in their case and yet another crucial factor of "Cost" was added to already challenging situation of data exchange, document delivery and network management operations. Limited number of photocopied pages sent through regular snail-mail was the only possible form of resource sharing which was too limited and in-effective as compared to the cost s involved in managing and sustaining of the Networks.

Library Resource-Sharing in the Online Digital Information Environment

The time of traditional library resource sharing networks is now over. Now in the current age surrounded by the new developments of information technology; the Internet, e-mail, high-speed data networks, web catalogs, Blogs and digital libraries thriving even in Pakistan, when I look back on LABELNET and DIEVINSA, it seems to me like a big white elephant. And I painfully recall how much hardwork it involved to obtain a copy of a 10-page document from another library for a user. It was harder if the request was urgent or the holding library was in another city or in another country. The political situation between India and Pakistan did not allow mail delivery across the borders, so we librarians were exchanging urgently required materials through friends in Nepal and Bhutan or Sri Lanka, patiently facing the arrogant user during months of wait in document delivery by mail. Now this is just a 10 minutes activity as I throw the document on my scanner's ADF, attach the output file with an e-mail message and click the SEND button to deliver it to anywhere in the world.

The technological developments within the past two decades have revolutionized the libraries' abilities to provide bibliographic access. Even if these developments did not arise to

serve the needs of resource sharing they have significantly increased the possibilities for resource sharing and changed the shape of resource sharing activities, introducing new challenges for the librarians.

The following issues, technologies and concepts have particularly emerged due to the impact of the resource sharing efforts in the digital information age:

Changed Role of Digital Collection Development Consortia

The fact that more and more information is now available in the digital form, which is accessible online in extensive amount, easily retrievable through powerful online search engines and shared with users located over long distances through high speed networks in virtually real time has introduced new forms of resource sharing among the libraries.

Information produced or acquired in the digital format by one institution, in an electronically connected environment, can be easily shared with other institutions. This fact has created a fear for economic survival among the publishers and producers of digital resources. So, the digital information resources are not only very expensive but the publishers impose a number of restrictions on "sharing" of their information. In certain cases the libraries only buy access to the resources but not the ownership.

This has given way to special form of Library Consortia where libraries get together to negotiate better terms from the publishers at a lower (shared) cost to each sharing institution.

The recent initiative of Higher Education Commission (HEC) in Pakistan is the example of a collective purchase of subscription license of scientific journal resources with access rights for the academic and research institutions all over the country.

The Higher Education Commission has secured inclusion in the *Programme for Enhancement of Research Information (PERI)* of the *International Network for the Availability of*

Scientific Publications (INASP). This programme aims to support capacity building in the research sector in developing and transitional countries by strengthening the production, access and dissemination of information and knowledge.

Through the inclusion of Pakistan in this programme, universities, colleges, not-for-profit research institutes and organizations will gain access to over 12,500 full-text online international academic journals from some of the world's top publishing houses. In addition, users in Pakistan will have access to many of the world's leading bibliographic and reference databases.

As of August 1st 2004, 86 public and private sector universities, 8 affiliated institutions, and 32 non-profit R&D institutions and teaching hospitals are participating in the PERI programme in Pakistan.

Interoperabilty of Digital Resources

As previously discussed, the base of every resource sharing effort is access to information. Information, now, is not stored on paper and contained in extensive library collection. In a digital environment, information is produced on computers, stored on computers and accessed across the Internet through the World Wide Web. Much of this information is on the "hidden web" which is controlled or restricted access commercial databases. But, locating and retrieving information from the available and accessible resources is not easily possible.

Standard web browsers are not enough to find the required information. Because the various online resources may have specialized protocols, the format standards of different databases may differ from each other and may not be user friendly, the search engines used by various resources may not be equally efficient. So, interoperability of the information resources is a major issue while considering the digital information sharing.

In case of the union catalog, for example, while the web-publishing and web-based updating has broken the barrier of time and cut down the database consolidation work. Moreover, Union catalog now is not necessarily one centralized catalogue, but a set of separately developed online catalogs may be made interoperable using the distributed search interface.

The distributed search of multiple, separately developed and managed information resources is enabled by standards such as Z39.50. The distributed search interface translate a user's query into an appropriate query for its constituent databases, submits it via Z39.50 to each of the remote systems of the interface, and retrieves and consolidates the results, which are presented to user's display. The performance of such systems however depends on the performance of the network links between client and the participating servers.

The Digital Libraries

The faculty, students and researchers in the academic and research institutions are the main producers of primary research. Publishing the result of their research and sharing it with the peers is the most challenging issue for most of the researchers.

Traditionally, the scholarly publishers and academic libraries have been playing complementary roles to facilitate the scholarly communication cycle; from publishing and distribution (by publisher) to management and archival preservation (by institutional libraries). Due to several factors, the publisher-library market relationships have begun to shift to the institutional digital libraries.

The digital library technology can compliment to the existing scholarly publishing model with an innovative publishing structure with faster online distribution facility as well as the systematic documents management and long-term preservation.

The digital collections which capture and preserve the intellectual output of a single or multiple institution or

organization, are called online Institutional Repositories or digital libraries.

Digital libraries are rapidly emerging as an essential component of the scholarly communication and information sharing systems for distribution and sharing of information resources of the institutions and organizations.

In Pakistan, the United Nations Digital Library is the first example of an institutional repository. This is an online searchable repository of full-text documents, reports, publications, press releases and other public information items produced by the country offices of United Nations Agencies in Pakistan. Access is free and open to all. The main purpose of this initiative is to share the information produced by the United Nations offices in Pakistan, to a wider range of audience beyond the barriers of time and space.

The Semantics, Ontologies and Taxonomies of Thesauri

For any resource sharing activity to take place, it is imperative to first organize the knowledge in a way so it can be shared. Knowledge organization is not new to librarians. But in the digital environment, the powerful search engines have brought in some new troubles to address. The lack of standardized access and interchange formats for the digital knowledge organization systems, may those be the commercial resources, the online catalogs, the digital libraries or just the Internet, are a barrier to their interoperability and wider use in automated Web and retrieval applications.

Empowering end users in searching collections of ever increasing magnitudes with performance far exceeding plain free-text searching (as used in many Web search engines), and developing systems that not only find but also process information for action, require considerably more powerful - and complex - knowledge organization systems (KOS) than the classification schemes and thesauri that previously existed (Soergel, et al., 2004). Such systems must serve the following functions, among others:

Improved user interaction with the KOS on both the conceptual and the term level for improved query formulation and subject browsing, and for more user learning about the domain.

Intelligent behind-the-scenes support for query expansion, both concept expansion and synonym expansion, within one language and across languages.

Intelligent support for human indexers and automated indexing/categorization systems.

Support for artificial intelligence and semantic Web applications.

Metadata Initiatives

The1990s has been seen as a decade of particular excitement, creativity and change for the libraries. It is known for the rise of the World Wide Web, and as the decade that the Digital Library was invented. It may also be known for an almost explosive proliferation of metadata schemes.

Metada is the standard used for the definition of digital resources for recognition and retrieval of the content through the Internet Search Engines.

Weibel and Koch (2000) define Metadata as a keystone component for a broad spectrum of applications that are emerging on the Web to help stitch together content and services and make them more visible to users.

A number of metadata initiatives like, MARC, Dublin Core Metadata Initiative (DCMI), GILS, URC, etc. have led the development of structured metadata to support resource discovery.

This has been a mixed blessing for libraries, presenting both opportunities and challenges. On the positive side, it has given us new options for describing materials that are poorly served by the AACR2/MARC suite of standards, and it has created a renewed sense of intellectual excitement in resource description. At the same time, these new formats have placed new burdens on

the library profession. As Caplan (2002) puts it, "Suddenly we are charged with supporting any number of schemes, not to mention maintaining registries of them and crosswalks between them. Suddenly there is an expectation we can control and give access to metadata created by organizations outside of our own library community."

The Digital Divide

The term digital divide or lack of access to ICT for certain segments of population, stands for the different degrees of access to information technology rather than a simple division between information "haves and have-nots". Almost everywhere in the world, Internet users are likely to be the young, urban, male and relatively well-educated and wealthy persons. Diffusion of technology among world population is extremely uneven. Unless this issue exists, despite the speed and efficiency, resource sharing in a digital environment will remain limited and ineffective.

Conclusion

The digital environment has facilitated resource sharing by breaking the time and distance barriers to efficient document delivery. However, for the librarians, this phenomenon has brought more challenging technical and technological issues demanding addition of more knowledge and skills to learn and new standards to develop. The overwhelming speed and growing volume of digital information is now becoming unable to acquire and manage by single libraries. Resource sharing, which used to be a side business in the librarianship trade, is now becoming the flagship operation in the library projects.

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