A Global Perspective on University Libraries and a Roadmap for Bangladesh Digital Library Consortium

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> The library connects us with the insight and knowledge, painfully extracted from Nature, of the greatest minds that ever were, with the best teachers, drawn from the entire planet and from all our history, to instruct us without tiring, and to inspire us to make our own contribution to the collective knowledge of the human species. I think the health of our civilization, the depth of our awareness about the underpinnings of our culture and our concern for the future can all be tested by how well we support our libraries.
>
> — Cosmos
> Carl SAGAN

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1   Introduction: The Waves of Change

Research and Education Networks (REN) established by the universities around the world are now opening up whole new set of possibilities to exploit information technology in higher education [1,4]. Nowhere the benefit of REN is as vivid as it is in the transformation of the libraries and the emergence of digital libraries (DL). The libraries of the world are currently undergoing revolutionary changes [2]. Research library provides two core function- (a) collection and archiving of human knowledge and (b) scholarly communication- dissemination of quality scientific knowledge. Digital technology is transforming both. Grand projects are now underway to digitize all available books that mankind posses. Some estimate as much as 10 million[1] books will be soon freely available on our desktops in few years. Some of the most valuable resources used to be available only to the limited scholars in the developed world. But now one can 'scroll' the intricate details of original Diamond Sutra- which its original printer Wang Jie "reverently made for universal free distribution on behalf of his two parents" in 868 AD, or literally 'turn' the pages of Sultan Bayber's magnificent Quran (digital library of British Library, 2005). Scholarly materials now can be made universally available irrespective of time and distance constraints.

The tree of modern knowledge has transcended into numerous branches of specializations. The area of scholarly communication is now served by a whopping 43,000+ active journals and periodicals [11]. RENs make it possible full-text resources from at least 14,000 of these to be delivered right at the user's desktop in any part of the world in seconds. There is now new tool for indexing, abstracting, cross-referencing. Integrated electronic processing is also being used to dramatically reduce the edit and publishing time.

Potential benefits of digital libraries are more pronounced for the libraries of the developing countries. An average US university spends about US$ 5 million in journals and periodicals, about US$ 2 million in monographs. It has about 3-8 million books and subscribes about 22,500 serials, and it adds about 30,000 books per year [2]. These are astronomical figures (20-150 times more) compared to the ability of most university in the developing world. For developing world the cost of collection and archiving of traditional print media is becoming prohibitively expensive. Particularly, hard hit areas are cost of

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[1] There are at least three grand initiatives. Google has teamed up with the libraries of Harvard, Stanford, the University of Michigan, Oxford University, and New York Public Library (NYPL). Another similar initiative has been taken by Open Content Alliance (OCA) supported by Yahoo! Yet another effort is already underway lead by CMU and partnered by major Indian and Chinese universities. See Digital Library of India (DLI) for more on it. The result of these multiple-year projects might be a massive online digital library of what could number as many as 30 million volumes. The programs will encompass books in and out of print, in copyright, and in the public domain—all available for full-text searching and, for the public domain items, free full-image viewing. How much success such grand projects will meet only time can tell. However, even if a fraction is realized that will be an enormous resource for the scholars worldwide.

periodicals and technological journals. Many libraries are rapidly shrinking. Digital content reduces the cost to a library by a factor of ten [3]. A Federated model further shrinks the cost per institution. It seems developing countries can benefit more from the digital library technology. Digital technology might be the only way to narrow this access gap.

Table-1 Some National University Libraries Around South Asia			
Institution	**Books**	**Serials**	**DL**
Jauharlal Nehru University, India	500,000	800	Yes
Bombay University, India	700,000	n/a	Yes
Chepauk Library, Madras University, India	509,263	642	Yes
Calcutta University, India	800,000	795	Yes
Punjub University, Pakistan	442,300	N/A	Yes
LUMS, Pakistan	52,000	325	Yes
Quaid-i-Azam University, Pakistan	195,000	276	Yes
University of Colombo, Sri Lanka	400,000	970	Yes
Tribhuvan University, Nepal	n/a	n/a	No
Royal University of Bhutan	n/a	n/a	No
University of Malaya Library, Malaysia	1,239,749	3631	Yes
Maldives has no University	X	x	x
Dhaka University, Bangladesh	550,000	250	No
Bangladesh Agriculture University, Bangladesh	182,000	200	No

Table-2 Potential Participants for BDLC	
Types	**Institutions**
Public Universities [1]	19
Private & International Universities [1]	54
Public Medical & Dental Colleges [2]	14
Private Medical & Dental Colleges	17
Open University	1
National University	1
Total Conventional R&D Universities	**106**
Research Institutes/ Centers	58
Research Academy	3
ARI Admintrative Centers	10
Collections-Major Library (Non-University)	7
Collections-Museum	8
Other Institutes & Centers	6
Total Other Institutions	**92**

Given the advantages of federated digital libraries, the European and US universities have congregated to form library alliances over the last ten years. Mega digital libraries alliances have emerged which are now serving hundreds of thousands of students, faculty, and researchers- each offering instant access to tens of millions of items creating unprecedented access to scholarly material. Even many in the developing countries are moving forward- the higher education bodies there have established associated federated digital libraries for their universities. As of the end of 2005, 92 countries have already formed REN and DL on them [8,9,10]. Bangladesh remains among the few exceptions. All comparable neighbors of her in South Asia including India, Pakistan, Sri-Lanka, and Myanmar have established REN [1,4,5]. Table-1 provides a comparative picture of the neighborhood national university systems.

The unprecedented worldwide transformation of the universities if missed will put the viability of her higher education in doubt. Particularly in peril is her public education system. Facilitation of access to information, knowledge and learning tools is basic premise behind institutional learning. Bangladesh should establish a National Digital Library as one of the core service of REN to mend this serious growing gap in access.

This paper is a sister paper of a proposal for REN [4]. A REN enables the entire research and education establishment of all disciplines of a country to come to an even point in technological readiness from where it can take full advantage of ICT and launch applications such as digital library. The submarine data cable now creates a new opportunity as well as a new momentum to revitalize the dilapidated infrastructure of the country's universities. Indeed, Bangladesh is expecting a huge surplus in international link capacity - until 2010 only 20% of the capacity will be used [6]. Also apparently a national political will exists to improve the quality of higher education involving all major parties. Thus, the higher education community should lead the case to build a strong ICT infrastructure including the establishment of a REN and a **Bangladesh Digital Library Consortium** (BDLC).

This paper presents the proposal for BDLC. It is a concept paper. It is not intended to present detail design. It draws upon an in-site situation survey on the state of higher education conducted in 2005. Section 2 first presents a '2005 stock check' on the university libraries of Bangladesh. Section 3 then gives an overview of modern digital libraries. Section 4 presents pertinent issues faced by the research university libraries worldwide. Section 5 presents their implications for Bangladesh, and finally section 6 outlays a possible road roadmap towards the consortium.

> **"if you think education is expensive try ignorance"**
> - **Derek Bok, President Emeritus, Harvard**

2   The State of Libraries in Bangladesh Universities

2.1   Poor Collection Getting Poorer

Since, the inception of the country in 1971, the libraries of its higher education institutions never got a chance to be in a competitive shape. These are now further deteriorating. Only 6 public universities have 100K+ records (Fig-1 & 2). Private university libraries are essentially empty. Half among the 50+ private universities reported to own just 5000 or less records [7]. Given the young age of these universities one might expect rapid acquisition. Unfortunately, only half reported adding just 1000 books between 2003 and 2004! Just to place the figures in perspective, a typical western university keeps about 4-15 million records. Even a high school library keeps about 20-30,000 records. Only one Dhaka University (DU) has any sizable collection (about 600K records). Yet, about 25-33% of this collection is believed to be antiquated. Most libraries have almost no audio-visual collections- one bothered to report an inventory of one record!

2.2   Vanishing Journals and Periodicals

The libraries are completely at lost in the face of journal pricing. The serial unit cost has increased by 188% between 1982 and 2004 at 2.5 times faster than the CPI inflation index. Western research university libraries kept up by doubling their budget [2]. But, in Bangladesh the universities simply dropped their subscriptions. For example, BAU reportedly dropped the

> A visit to any Bangladeshi university library-private or public- exudes a contrasting duality- you feel the aura of caring librarians and equally uncaring administration.

number of titles from 700 to 200 between 1974 and 2005. Subscription to print journals in private universities is virtually non-existent. None of the public universities, including the largest research and technical universities DU and BUET can provide access to any electronic journal to its students or faculty. Few private universities provide access to limited collections namely DOAJ, AGORA, HINARI, OUP, eGranary, EMERALD and JSTOR. Not a single institution in Bangladesh could afford the institutional membership to any major medical, engineering, or technology collections such as ACM, IEEE, or Elsevier, Academic Press journals and proceedings.

2.3   Administrative Policy Strangulation

There is apparently no way in sight to shine any hope of reversal. Libraries are also at a point of administrative strangulation. For years, many senior library positions in the universities were left vacant or filled by faculty administrators. It is not hard to see that the issues concerning modernization of libraries have been neglected for years at policy and subsequent funding decisions- both within the university as well as at higher levels. Policy framers play a very important role in multiple levels in the strategic adoption of technology [5]. A visit to any Bangladeshi university library-private or public- exudes a contrasting

duality- you feel the aura of very caring librarians and equally uncaring administration. University administrations are in competitive posture rather than in cooperative mode. This is not unexpected given the non-existence of any form of REN network which is essential for university libraries to join hand and benefit from cooperation. There is not adequate training for library professionals. Practically, there is little hope that Bangladeshi libraries will ever be able to recover following the current path. The only hope to restore access might be a rapid development of a digital library.
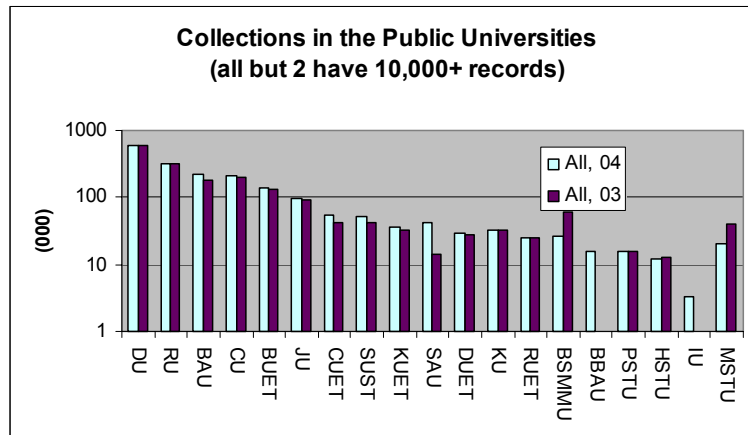
Collections in the Public Universities
(all but 2 have 10,000+ records)

Fig-1

Collection in Private University Libraries
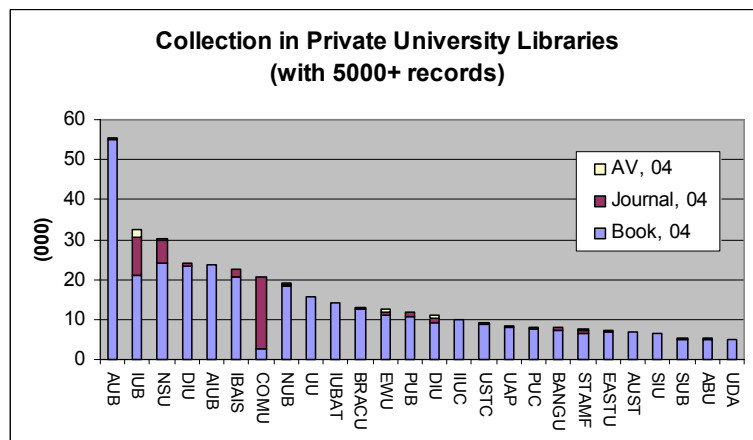**(with 5000+ records)**

Fig-2

2.4   Library Automation Initiative in the Country

In recent years, several universities have taken disconnected initiatives for library automation systems (LAS). In a 2005 survey, out of 17 public universities 5 and out of 39 private universities 9 responded to have some form of E-library [13]. BUET has just completed the development but yet to lunch. There are few other problems such as lack of standardization work- specially, in the area of handling Bengali records, lack of inter-library exchange, program etc.

2.5   Failure Analysis on Past Initiatives on Collective Services

Since, 1980s' there have been several attempts by UGC to unify the library catalogue systems and to arrange some form of cooperative journal subscription (Awwal, 2005, UGC Annual Report 2003 [12]). But it is yet to be realized. It is not hard to apprehend why. The idea to avoid duplicate subscription was right, but without any REN or a sharing infrastructure/mechanism between institutions- the circulation actually turns harder. The benefit remains localized. Naturally, universities did not cooperate among themselves or with UGC in this model. While library community and UGC clearly foresaw the need of a digital library- but without REN it became an attempt to put the cart before the horses. Currently, there is another circulating proposal (to build e-catalogue for Dhaka University library.) entitled A Networked E-Union Catalogue for Public University Libraries. But, since it is not clear how it will benefit others (seeming it is again the lack of REN) it has timid support from others.

In 1998, there were a networking attempt called Bangladesh National Scientific and Technical Library Information Network (BANSLINK). It ventured to connect libraries across the country by setting up a network with 15 libraries- 6 out of Dhaka and 9 in Dhaka via dial-up links. The initiative fell apart due to administrative reorganization at the top and subsequent lack of support.

However, the organizers of the previous attempts should be considered as pioneers and valued member in BDLC initiative as there are important lessons to be learned from failures much of which were clearly structural. BLDC will tremendously benefit from the collective experiences.

> **"The beginning is the most important part of the work"**
> **-Plato**

3   Overview of Modern Federated Digital Library

A modern federated library is a complex system. Typically, the university's library automation system running on the REN serves as its front end with a web interface. In backend it is connected to numerous databases- both local and remote. It has several components- the computing and communication infrastructure, various services software, and various content and index (catalogue) databases. It requires an infrastructure network via which students and faculty can access the entire library portal and resources from the library, departmental offices, and dormitories. In the backend the network must have a high-performance link all the way to the content provider's systems. Federated digital library alliances also have started adding their own data centers.

The first step towards a digital library is to have *collection* which has *electronic catalogue* and *digitized content.* Bulk of the pre 1980's collection requires digitization. However, newer books and articles are now originated in digital forms. A *Digital Library* points to collections both local and remote. A digital library needs to manage *federated authentication* and access manager middleware on top of the regular network. All systems need to have various sophisticated inter-database record search and matching capabilities.

The main content currently served by DL is journals and periodicals. Besides, there are major collections on art and architecture images, audio recordings, satellite images, maps, social studies related materials, educational videos, foreign language videos, demonstration videos, etc. There are already growing E-book collections of classic books, technical reference books, encyclopedias, handbooks, biographical books, guides, government publications, masters' theses and doctoral dissertations. Also, a recent trend is to add courseware materials.

Collections of a DL are offered by (a) full content from publishers (such as ACM, Elsevier) (b) research databases which are third party value added secondary and tertiary catalogues, and (c) master catalogue and contents owned by the member organizations. Historically, most DL systems started with records of the last type- but increasingly the first two types of remote resources are becoming the major components of a federated system. While, many of the databases of the first two categories are now online, few of these databases may come off-line such as in CD. A modern DL offers user-initiated and non-mediated online borrowing through the search portal.

> **"The delivery of new and innovative services through digitization projects and distance learning technologies is transforming the brick-and-mortar library model to a virtual model. We are still in the early stages of a long transition period where a hybrid model will reign."**
> **--Kyrillidou & Young 2005**

4   Trends and Issues Facing Western Libraries

4.1   Rising Cost of Journals

The serial unit cost has increased by 188% between 1982 and 2004 at 2.5 times faster than the CPI inflation index. Some top journals are costing 5,000-8,000 US$ for 12 issues. Western universities primarily responded by increasing their serials budget at par with this rise. Few reduced their monograph budget. However, western research university libraries have seen some recent decline in serial per unit cost [2]. It has been attributed to consortia licensing arrangements for electronic journals. In some cases elimination of the print subscription has resulted in reduced fees for the electronic-only version. The libraries are facing a new 'Big Deal' challenge from the publishers. Publishers are bundling online subscription so that individual journal subscriptions can no longer be cancelled forcing libraries to subscribe journals they don't want.

4.2   Open Access Scholarly Publication Movement

Higher education communities worldwide are also searching for alternate models of publication to fight the rising cost of conventional journals. For example, SPARC is an initiative [2] spearheaded by US Association of Research Libraries (ARL) and it is encouraging research community based online scholarly publication where servers are jointly contributed by the universities. In another effort Higher Education Funding Council for England (HEFCE) has joined hand with online publisher BioMed Central and Public Library of Science (PLS). This effort is pursuing a new business model which charges a small fee to the author(s) but offers open and free access to reader(s) universally. This is based on the premise that current practice of charging readers is out of control and it is acting more as a restricting force rather than helping the dissemination of scholarly knowledge- whereas the later is the first purpose of any systems of scholarly publication.

4.3   Formation of Library Alliances

Western libraries are also forming digital federations. Examples of advanced US federations include OhioLINK, Pacific Rim Digital Library Alliance (PRDLA), The Greater Western Library Alliance (GWLA), etc. It is believed that there are now more than 200 library consortia.

Digital format has been found to substantially reduce the cost of printing, archiving, and access. A study [3] on eleven US academic libraries on the life-cycle costs that includes long-term preservation and access, found larger libraries save about 20-66% cost and smaller institutions save a higher- 87-92% in electronic format over print format material. However, such benefit of technology does not necessarily percolate straight to the individual libraries. This required also forming federations. The universities in mid 90's developed their REN. This gave the infrastructure to share digital information almost cost-free. Consequently, after decades of steep rise, the federated libraries are for the first time seeing decline in per unit serial cost since 2004. By purchasing as a group, the Ohio LINK

consortium reported cutting about 75 percent off the list price of electronic journals and reference databases [15].

OhioLINK is a typical model of a state-of-the-art federation. It is a venture initiated by Ohio Board of Regents (OBR) that funds the universities of Ohio- a body similar to UGC. It is currently serving more than 600,000 students, faculty, researchers and staff at 85 institutions, which includes 17 public universities, 23 community/technical colleges, 44 private colleges and the State Library of Ohio. OhioLINK is connected via OARNet- Ohio's higher performance research and education network. It offers online access to more than 44.8 million library items, 100 electronic research databases, full-text 6,400 scholarly journal titles from 80+ publishers across a wide range of disciplines. It also has a Digital Media Center (DMC), a growing collection of E-books, and an Electronic Theses and Dissertations Center (ETD). OhioLINK[2] was the first consortium of public and private college libraries with state funding [11, 15].

> **"A popular government without popular information, or the means of acquiring it, is but a prologue to a farce or a tragedy, or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own governors must arm themselves with the power which knowledge gives."**
> **— James Madison**

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[2] In another pioneering initiative Ohio is building an all-university owned dark fiber network.

5   The Idea of Bangladesh Digital Library Consortium (BDLC)

Bangladesh like many other countries in the developing world is undergoing a phase of rapid expansion in higher education. University Grants Commission (UGC) is facing an uphill battle to keep up the existing libraries. Private universities are also fighting the same battle. However, the silver lining is that more than 70 institutions are now in the same phase of active collection development. And another 50-70 institutions will be willing participants (Table-2). There can be no better time to launch a federated digital library. A National Digital Library and Library Automation Initiative will ensure the following strategic benefit immediately:

1. Access to latest scientific publications has reached almost none in public universities. Universities have dwindling access to books, journals and periodicals. This is having crippling effect on the future of national science and technology readiness. A federated digital library model offers only realistic possibility to reverse the situation. It will not only restore this access to a respectable size and quality, but also make it comparable to that at developed world.

2. Vast amount of electronic books, courseware, and multi-media content are already available via open access. A Digital library gateway can make them instantly accessible to the students, faculty, and researchers of Bangladesh. There are major international projects underway to ensure free access to monograms. These collections far exceed the size of any current collection in Bangladeshi universities.

3. For Bangladesh almost none of the institutions individually are found to be capable of subscribing important periodical collections such as IEEE, ACM, or even the supposedly low cost new mode scholarly publishing (such as the SPARC or Digital Library of Science). But, roughly, any federation with four members breaks even the cost- a federation with 30 members may expect about 7-5 times reduction in cost per institution.

4. Some publishers are very large as organization. Federation provides better negotiating position to keep the cost under control. Increasingly the publishers are bundling journals as Big Deal. Individual institutions may not find all titles in a bundle useful but a large federation with more research diversity will benefit more from Big Deal.

5. Even free access collections have restrictions such as Creative Comments licensing. Due to complexity of intellectual property laws and their variations across nations many of these collections are reluctant to enter into access contracts with small entities. It is easier to workout access contracts if the universities approach as a federation.

6. The automation of the libraries will help in improving other library services including better collection management, accounting and reduce floor-space usage. Demand and usage can be tracked more accurately with new tools [14]. Unused periodicals can be unsubscribed.

7. Information property is fast becoming a major commodity in the 21st century. Developing countries may loose squarely rights on its intellectual resources due to digital divide. Locally originated content and intellectual properties may have to be bought back.

8. Without a digital publishing and archiving system, researchers from a non publishing country will remain obscure. The problems of the developing world will get lesser importance and lesser recognition in research communities, and there will be lesser efforts to solve them.

DL in Bangladesh, like other countries, is expected to be capital saving and pay-off in few years. The members may want to pool together a part of their current library resources. It is expected that the saving from journal budget alone will pay for the best part of the cost. However, international assistance funding is also expected to be available provided the libraries can internally organize themselves. The next section offers some specific recommendations.

> **"There is nothing like dream to create the future. Utopia to-day, flesh and blood tomorrow."**
>
> - **Victor Hugo ,**
> - **Les Miserables, 1862**
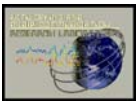
6   A Road Map

6.1   Initiating the Initiative

1. UGC can start by convening a conference inviting all the (a) private and public universities, (b) research organizations, (c) academies and (d) major libraries of Bangladesh. Table-2 provides a map of potential member institutions for this initiative.

2. Invite participants from the three communities (a) professional librarians (b) interested faculty researchers from information sciences, library sciences, and computer sciences and engineering and related fields, and (c) chief operating officers. Form a steering committee to decide the mission, membership, planning and budgeting.

3. The next step will be to discuss the concept and collect letter of interest and initial commitment from interested organization. With the concept and a unified platform of the higher education of Bangladesh under UGC leadership seek national and international funding. The new consortia may seek technical cooperation by partnering with some established consortia.

6.2   Organizing the Consortium

4. Establish key technical committees/working groups in areas including (a) software development (b) standardization & interlibrary cooperation, (c) collective resource procurement, (d) e-catalogue and digitization, (e) publishing and hosting support services (f) user services & training etc. to lead in respective technical areas. Invite leaders of past initiatives for their experience and involve new bloods for new ideas.

5. Initiate signing a memorandum of understanding by members. There should be some commitment such as subscription, library facilitation to make their libraries and campuses DL enabled, providing REN connectivity, adequate access terminals, reading and browsing rooms, adherence to sharing policies.

6.3   Functions and Services

6. Begin immediately: Roll out the first version of the digital library. UGC and the members should establish an initial budget and may roll out a very basic web based digital library system with open access and already member subscribed materials.

7. Expand access: Join larger international, multi-national, regional and trans-continental DL federations to further obtain leverage in gaining access to content.

8. Expand services: Move to create a state-of-the-art online publishing service. It should provide full editorial process management, publishing, hosting and permanent

archiving facility to the journals and proceedings published by the faculty and researchers of its member organization and professional organizations in Bangladesh.

9. Move for unified cataloguing, digitization and sharing of local content. Establish *Inter Library Loan Program* (ILLP) to complement the inter library catalogue sharing.

10. Plan for a Digital Library Data Center for mirroring, caching and permanent archiving of contents. Roll out innovative systems such as LibQUAL+® for online user tracking.

"A university is just a group of buildings gathered around a library."
— Shelby Foote

"The true University of these days is a Collection of Books."
— "The Hero as Man of Letters". On Heroes and Hero Worship.

Thomas Carlyle (1795-1881)

7 Relevant Issues

7.1 Expertise

The technical challenge of DL is substantially different from REN. It would require technical experts in information and library sciences (rather only pure computer scientists or engineers), and experts in user areas. For example an archeological archive would need archeologists and historians to manage standards for indexing organizing, and maintaining as much it would need a database expert. It will also require permanent professional librarians and ICT engineers in central and member library sites. Training will be very important due to rapidly changing nature of the technology. Provisions have to be built into the budget of the proposal.

7.2 Library Automation System Software (LAS)

A local team can build a LAS and the web-based DL access system. There are several free open source DL software developed by UNESCO and other organizations. However, associated standards for federated access management, ontology, multi-lingual document management, digital object exchange, e-commerce, etc., are still actively evolving. Thus, Bangladesh will gain strategic advantage by grooming local developer team(s). System need to evolve at par with the growth of the technology and the need of the local institutions over many years. The plan must embrace this long term evolving nature of the project's development phase. The initiative might want to support two of the existing locally developed library automation systems. Let the interested LAS vendors make technical presentation on their systems. Then let customer institutions choose and align with either one of them based on their detail organizational need. Select two favorites and let both the systems be developed under initiative's funding. It is crucial is to specify their interoperability. Other's who still may choose to use their own LAS, should be able to do so as well by making them interoperable with the initiative favored systems.

7.3 Master Catalogue and Digitization

The driving force behind most digital library alliances was to pool together the materials owned by their members. However, now the remote digitized materials are the gem attractions. This is particularly the case for the developing countries. Local universities here currently own a combined total of about 2.2 million records including duplicates [7]. Vast more are now accessible and downloadable online. Thus the reality is such that online access system to DL is strategically much more important than the local electronic catalogues. India and Pakistan each provided access to DL first. However, the REN and DL will generate interest back into local catalogue. Institutions may be encouraged to digitize catalogues in phases with priority given to materials of local origin and language, and of unique value. It can even join hand with international digitization initiatives. Any funding from the commons should encourage its recipient to make primary content available for borrowing by all in the commons.
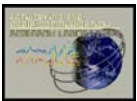
7.4   Standardization

The digital library and electronic cataloguing will require conformance with many interoperability standards if it were to access worldwide digital resources. A technical committee within the initiative should familiarize themselves with the ongoing issues with related international standards such as Dublin Core, IEEE LOM, Open Archives Initiative, TEI, APPM, AACR2, MARC, ISBD, OWL, etc, and advice the initiative as needed. The body should also undertake leadership role in advancing standards related to Bengali records and make other Bengali language constituencies from West Bengal and abroad and relevant organizations such as LAB, BALID, and BSTI involved.

7.5   Indigenous Collection

It will be a timely idea also to simultaneously initiate a digital publication service for scholarly publications of local origin. These have to be done in two forms- one for scholarly articles and another for monographs (books) and special value collections. There is currently no local digital archival and circulation system though there are quite a few journals and regular conferences within the country. An offer to host local academic journals/proceedings by BDLC is expected to be highly appreciated by their editors/organizers. BDLC can also extend this service to offer editorial process management similar to those offered by EDAS® or Manuscript Central®. This will encourage national and international scholarly activity within the country. Such initiative will offer greater global visibility to local scholars and researchers and to their research problems and would provide important advantage to retain the intellectual property rights of the local scholars.

> ".. inherent to the Internet and the Web is a force for openness and opportunity that should be bedrock of its use by the universities.."
>
> –Charles M. Vest, President Emeritus MIT

8   Acknowledgements

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