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National Seminar  
on  
**Cross-talk of Digital Resources Management**  
step towards Digital Bangladesh

PROCEEDINGS

22 August 2015

Organized by  
**Bangladesh Association of Librarians, Information Scientists and Documentalists (BALID)**  
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National Seminar  
on  
**Cross-talk of Digital Resources Management**  
step towards Digital Bangladesh

**22 August 2015**

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Dhaka, Bangladesh

Organized by  
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National Seminar  
on  
**Cross-Talk of Digital Resources Management: step towards digital Bangladesh**

**Saturday, 22 August 2015**

**Organized by**

Bangladesh Association of Librarians, Information Scientists and Documentalists (BALID) in collaboration with Center on Integrated Rural Development for Asia and the Pacific (CIRDAP).

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**Program Schedule**

**08.00 - 09.00 Registration**

**09.01- 10.30 Opening Ceremony and Keynote Session**

**Welcome Address**

Sasanka Kumar Singha, Secretary General, BALID

**Keynote Paper**

**Digital resources management in libraries: Step towards digital Bangladesh**

*A. I. M. Jakaria Rahman, Md. Mostafizur Rahman, Muhammad Hossam Haider Chowdhury*

**Keynote Paper**

**Model community library O milon kendro (Summary)**

*Hazera Rahman*

**Address by Special Guests**

**Begum Akhtar Jahan**

Member of Parliament & Member of Standing Committee on Ministry of Finance,  
Bangladesh National Parliament

**Advocate Hosna Ara Lutfu Dalia**

Member of Parliament & Member of Standing Committee on Post, Telecommunication  
and Information Technology, Bangladesh National Parliament

**Address by Chief Guest**

**Mr. Imran Ahmad**

Member of Parliament & Chairman of Standing Committee on Post,  
Telecommunication and Information Technology, Bangladesh National Parliament

**Address by the Chairperson**

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**Vote of thanks**

**Dr. Md. Nazim Uddin**

Convener, BALID Seminar 2015

**10.30 – 11:00 Refreshments**

**11:01 - 12:15      1<sup>st</sup> Technical Session: Open Source Software in Libraries**

**Session Chair: Prof. Dr. M. Kaykobad**  
Dept. of Computer Science and Engineering, BUET

**Koha: An open source integrated library system**  
*Dr. Md. Zabid Hossain Shoeb*

**DSpace: An open source repository software**  
*Kazi Farhad Noman*

**GreenStone: An open source digital library software**  
*Md. Abasan Habib*

**Senayan Library Management System (SLiMS): An open source library management system**  
*A.K.M. Nurul Alam*

Presentation of **Elsevier**, a world-leading publisher of scientific, technical and medical information products and services.

**12:16 – 13:15      2<sup>nd</sup> Technical Session: Digitization in Libraries**

**Session Chair: Mr. Ashish Kumar Sarker**  
Director General (Additional Secretary), Department of Public Library

**North South University Library Management System: Experiences of customization in library automation and digitization**  
*Md. Mostafizur Rahman , Molla M. Shoeb, Rajiv Mahmud , Isbrat Jaha Chandburi*

**Steps towards digital Bangladesh: Bangladesh Bank library perspectives**  
*Md. Samsur Rahman, Sawad Bin Shahid, Tasnim Fatema*

**Model community library O milon kendro**  
*Hazera Rahman*

**13:16 – 14:30      Lunch and prayer break**

**14:31 – 15:15      3<sup>rd</sup> Technical Session: Use of ICTs in Libraries**

**Session Chair: Prof. Dr. Md. Nasiruddin**  
Chairman, Dept. of Information Science and Library Management  
National University

**ICT use in the Library of Independent University, Bangladesh: Past, present and future plan**  
*Muhammad Hossam Haider Chowdbury; Md. Zabid Hossain Shoeb  
Md. Mukblesur Rahman; Nur Abammad*

**Automation of resource management in BUET central library: Procedure of implementation of integrated library management system**  
*Shah Abdul Kabir and Md. Absan Habib*

**15:16 – 16:20      4<sup>th</sup> Technical Session: Web-based services and Digitization**

**Session Chair: Mr. Minhaj Uddin Ahmed**

Director, Centre for Information Studies, Bangladesh (CIS,B)

**Discovery to Delivery: Web-based library services of ICDDR,B**

Dr. Md. Nazim Uddin, Md. Shafiur Rahman, M. Al Mamun, Md. Harun-Or-Rashid Khandaker

**Libraries of Northern University Bangladesh: Progress in digitizing**

Dr. Dilruba Mahbuba

**Developing CIRDAP institutional repository for member countries**

Dr. Usha Rani Boruah

**16:21 – 17:20      Plenary Session**

**Session Chair: Dr. Mirza Mohd Rezaul Islam**

Chairman, BALID and BIIM

**Discussants**

**Mr. Shyama Prasad Bepari**

Joint Secretary, Ministry of Education, Govt. of Bangladesh

**Mr. David Hilton**

OIC, CIRDAP

**Prof. Dr. Abdus Sattar**

Controller of Examinations, University of Information Technology & Sciences (UITS)

**17:21 – 18:00      Closing Ceremony and Refreshment**

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## **Digital Resources Management in Libraries: Step towards digital Bangladesh**

A. I. M. Jakaria Rahman<sup>1</sup>, Md. Mostafizur Rahman<sup>2</sup>,  
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**Abstract:** The purpose of this paper is to investigate the existing digital resource management systems and practices in Bangladeshi libraries. This paper followed a mixed research approach and collected primary data by questionnaire method. It explored the library professionals' conception about digital library and institutional repository that best fit in Bangladesh context and their practices. The findings indicate that there is an enormous development in library digitization initiatives in the last decade. The libraries are facing challenges like capacity building, declining budgets, insufficient facilities, and traditional functions knocked by modern technologies. Despite many obstacles, the library professionals are leading from the front in digitization projects and implementing digital resource management systems. This paper also discusses some issues, for instance, digital library, institutional repository, open source software, metadata, vocabulary, open access vs close access, copyright issues, user's needs, user interface, virtual reference, organizational policy, barriers, etc., and suggested a set of practical guidelines and proposed collaborative digitization initiatives.

**Keyword:** Digital resource management system, Digital library, Institutional Repository, Metadata, Open Access, Federated search, Virtual reference, Vocabulary, Bangladesh.

### **1. Introduction**

Libraries in Bangladesh are at the crossroads of digitization system. Some libraries have already stepped into the new era of library, the digital resource management (DRM), while the majority of the libraries continue to practice traditional librarianship. There is increased demand for access to digital materials, preservation, and conversion of print materials into electronic format for longer life, and ensuring multiple users access to limited resources. Researchers recognize that library education in Bangladesh emphasize on the traditional librarianship (Rahman, Khatun, & Mezbah-ul-Islam, 2008; Ameen, 2014) as the majority of the libraries require this. This is mostly due to resource constraints. Most libraries cannot even afford computers to begin their transition towards DRM systems. Only a handful organizations can afford dedicated IT experts as a library team member (Rahman, 2010). Despite these limitations, the few professionals who are working on the development of the DRM systems are either self-motivated and self-trained, or received on-job training, or attended the trainings organized by Bangladesh Association of Librarians, Information Scientists and Documentalists (BALID) including other organizations. While some libraries are in the race to embrace the challenge of digitization and have gained experience, the majority are yet to catch up with the knowledge. The latter is uncertain about how to roll the stone, such as which systems and tools to use for managing digital resources effectively, what are the standards and best practices, what kind of challenges are waiting for them, and how and where to find solutions to win those challenges. Moreover, there is some misapprehension about the terminologies and practical application of preservation and access to materials with respect to copyright and intellectual property right. In this paper, we have focused on some of these issues useful for the libraries practicing DRM system as well as those who are about to step in the world of digitization.

## 2. Methodology

We followed a mixed method approach (Matthews & Ross, 2010; Creswell, 2013) that required both qualitative and quantitative data. For this paper, we designed two online questionnaires (see Annexure): the first one gathered data on the libraries that initiated or implemented DRM systems, as well as the libraries, which are in planning stage. It included both *close-ended* and open-ended questions. We email this questionnaire to the library heads. The second questionnaire gathered library professionals' views on DRM system and future directions through open-ended questions. We emailed this questionnaire to two e-mail groups of library professionals, namely 'BALID-BD' and 'LISBD'. We also made this available in the Facebook group of 'Library professionals of Bangladesh' (around 670 members). In addition, we explored different library websites to check the content of the DRM system and directory of open access repositories. We interpreted the findings from the comparison of the discoveries as those emerged from the collected data as well as literature reviews.

## 3. Status of Digital Resources Management

### 3.1 Early initiatives

In Bangladesh, the first bibliographic database was initiated by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) library, and the Agricultural Information Centre (AIC) of Bangladesh Agriculture Research Council (BARC) with microcomputer in 1987 (Khan, 1989; Foote, 1993). The ICDDR,B library started with 'In Magic' software and later shifted to CDS/ISIS (Computerized Documentation System/Integrated Set of Information Systems) database software in 1989 (Chowdhury and Khan, 2012). AIC used to provide services through the Food and Agricultural Organization's (FAO) CD-ROM databases – AGRIS (Agriculture Research Information Service) and CARIS (Current Agriculture Research Information Service) - a global database providing agriculture related bibliographic information (Foote, 1993). Further, ICDDR,B Library offered full text and bibliographic databases on CD-ROM namely Medical Literature Online (MEDLINE), Population Literature Online (POPLINE), and Asian Health, Environmental and Allied Databases (AHEAD) respectively from 1989, 1993, and 1994 (Chowdhury and Khan, 2012; Eeckels, 1997). Bangladesh National Scientific and Technical Documentation Centre (BANSDOC) library started to provide CD-ROM database abstract service on Biological Abstract, Physics Abstracts and Current Contents on life sciences in 1997 (BANSDOC, 1998). Similarly, North South University (NSU) library also offered CD-ROM database services on Economic Literature (EconLit), AHEAD, and Global Development Finance databases in 1998 (NSU, 2015).

In 1998, BANSDOC launched the Bangladesh National Scientific and Library Information Network (BANSLINK), the first online library network to connect 15 libraries (6 out of Dhaka and 9 in Dhaka) via dial-up connections under the project entitled automation and networking of science and technology libraries in Bangladesh (BANSDOC, 1998; Chandel & Begum, 1998). This initiative, however, failed to survive due to non-cooperation from the parent organization of the member libraries of the network (Uddin & Chowdhury, 2006). In the same year, University of Dhaka launched automated library system with GLAS (Graphical Library Automation System) software (Munshi, 2003), but the software lost its functionality in 2000 (Chowdhury & Khan, 2012). Since 1993, Internet has been available in the government sectors followed by the private sectors in three years (Azam, 2007). ICDDR,B library, NSU library and Independent University Bangladesh (IUB) library pioneered in providing internet connection in the libraries in Bangladesh. BANSDOC library was the first public sector institution to provide internet services to its users since 1999 (BANSDOC, 2000), followed by Press Institute of Bangladesh (PIB) Cyber Centre in 2000.

In 2002, the National Archives of Bangladesh initiated to digitize district records covering the years 1760-1900, but the project was dropped in the midway (Shuva, 2012). In the same year, NSU library and BRAC University (BRACU) library subscribed to online journal databases followed by IUB library in 2003. In early 2003, NSU library launched a full-text digital repository with customized software named NSU-Library Management System (Rahman, 2015). In Bangladesh, the use of Free and Open Source software (FOSS) started in 2005 as ICDDR,B library launched institutional repository with DSpace software. In 2006, the Bangladesh INASP-PERi (International Network for the Availability of Scientific Publications - Programme for the Enhancement of Research Information) Consortium (BIPC) was formed to access electronic journal databases (Uddin, 2009; Tariq, 2010; Islam, 2013). This consortium officially launched in January 2007 with 13 organizations and subscribed 12 databases. Later in 2008, BRAC university library started to manage their digital resources with DSpace software and launched Integrated Library System (ILS) using Koha (Open Source) software in 2010 (Afroz, 2014).

### **3.2 Current initiatives**

Since 2011 until mid-2015, a good number of libraries in Bangladesh have implemented DRM system. These include Asian University for Women, Bangladesh Agricultural Research Institute (BARI), Bangladesh Agricultural University (BAU), Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh Bank, Bangladesh Bureau of Educational Information & Statistics (BANBEIS), Bangladesh National Museum, Bank and Financial Institution Division (BFID) of Ministry of Finance, Chittagong Veterinary and Animal Sciences University (CVASU), Daffodil International University (DIU), East West University (EWU), Eastern University (EU), Independent University Bangladesh (IUB), Islamic University of Technology (IUT), National Institute of Nuclear Medicine and Allied Sciences (NINMAS), National library of Bangladesh, Shahjalal University of Science & Technology (SUST), Sufia Kamal National Public library, and University of Dhaka (DU).

Further, Bangladesh Secretariat Central Library, Bangladesh University of Engineering and Technology (BUET), Center on Integrated Rural Development for Asia and the Pacific (CIRDAP), Khulna University of Engineering & Technology (KUET), Sher-e-Bangla Agricultural University (SBAU), Society for Environment and Human Development (SHED), South East University (SEU), Stamford University Bangladesh (SUB), University of Rajshahi (RU) library have already taken initiatives to introduce DRM system.

The two-third of the above mentioned libraries preferred DSpace and the rest used GreenStone followed by SLiMs, customized software and commercial software. However, some of the libraries that have implemented DRM system were found inactive. Surprisingly, some libraries initiated a DRM system without having an ILS, while some libraries are planning for implementation of ILS and DRM system together. University Grants Commission (UGC) of Bangladesh has set up an e-resources consortium called the UGC Digital Library (UDL) as a sub-component of Higher Education Quality Enhancement Project (HEQEP) in 2012 (Ahmed, 2014). Currently, 41 universities have joined the consortium (UGC, 2015). The UDL provides access to subscribed e-journal databases only. The UDL is practically a gateway, not a Digital library.

It is mentionable that BANSLINK launched just after two years of availability of the internet for general people in Bangladesh. It signaled that libraries could make better uses of computers rather than as office equipment only. Three decades have passed since the initiation of computerization in Bangladeshi libraries. The computer technology has been changing rapidly and it took time to train library professionals as tech-expert. In addition, costs of commercial software were another noticeable obstacle to the progress of digitization in Bangladesh. Yet, considering the first digitization initiative in 2003, and introduction of open source software in 2005, engagement of 31 libraries in the digitization process demonstrates much potential. In Bangladesh, e-journal databases first appeared in 2002. Currently, 47 libraries are subscribing 37 databases (including 13 free of cost databases) through BIPC and providing access to the users. It is evident that libraries welcome e-journal databases immediately after its availability in Bangladesh. Moreover, libraries took the advantages of open source software for digitization within two years of its appearance (public version of DSpace released in November 2002). The library professionals played the key role for these accomplishments. It is an enormous achievement in the last decade, while computerization and digitization got momentum in Bangladeshi libraries. A report from the British Council (2015a) indicates that public library usage is increasing rapidly in Bangladesh despite insufficient reading resources. These surely register advancement of the library sector in Bangladesh.

## **4. Concept of Digital Library and Institutional Repository**

### **4.1 Digital library**

What is a library? The answer is likely to vary based on whom we ask the question and the type of the library where the respondents work. To get a comprehensive perspective of the library professionals on the conception of the library, we should begin with more specific questions about the type of library (national, public, academic, special or private), so that we might avoid the misperceptions. Similarly, the concept of digital library (DL) has many interpretations and diverse definitions that need to be treated with proper care. It is often argued that the internet is a huge DL, which is wrong. The Internet is a collection of crowds of documents and has nothing about selection of materials (Cleveland, 1998). Even the Library of Congress admits that it does not collect everything and nor it would want - selection of materials. Similarly, it is tempting to use the term DL for any collection of digital object that have some means of navigation and retrieval (MacColl, Jones, & Andrew, 2006).

In 1990, the term ‘Digital library’ appeared for the first time in literature (Bawden & Rowlands, 1999). However, before and after the first appearance, phrases like ‘virtual library’, ‘electronic library’ (Battin, 1984; Buckland, 1992), ‘library without walls’ (Fayen, 1986; Chartier, 1993), ‘hybrid libraries’ (Rusbridge, 1998; Oppenheim & Smithson, 1999; Pinfield et al., 1998) have been used interchangeably to define the concept of digital library (Rahman, Francese, Yilmaz, & Beyene, 2011). In literature, DL provides access to selected digital objects that contain organized information and knowledge, and information sources are seamlessly integrated (Yerkey & Jorgensen, 1996), including data and metadata, provide access and retrieval to a community of users with coherent access from anywhere of the world (Borgman, 1999, Arms, 2000; Shiri, 2003; Rahman, 2007; Witten, Bainbridge, & Nichols, 2009; Chowdhury, 2010). It also offer integrated environments with collections, information services, and preserving knowledge and effectively support learning (Chen & Lin, 2014), including full-text indexing, ranking, searching for information retrieval that is quite different from traditional libraries (de Smet, 2014).

There are around 64 formal and informal definitions of DL (Schwartz, 2000). A large amount of literature contains discussion on how to define DLs (Calhoun, 2014). These literatures produce many wordy definitions of the phrases DL or DLs. Some definitions focus more on technical issues than the wider social context of DLs (Lagoze, 2010). Some definitions describe the DL as a collection of documents in organized electronic form and available on CD-ROM. If we considered these pointless definitions, a CD/DVD-ROM with a couple of movies has to be considered as a DL. However, a DL is not equivalent to a digitized collection with information management tools (Sun & Yuan, 2012). The definition of DL has changed over the time due to the change of technological development. The computer professionals viewed it as a distributed space of the interlinked information system; library professionals indicated it as a system with new kinds of information resources for operating the library functions; users identified it as a computerization of traditional libraries, while the IFLA/UNESCO manifesto (IFLA, 2010) on DLs stressed on bridging the ‘digital divide’ (Calhoun, 2014). It seems different professionals have tried to define DL from their own perspectives.

We have received a considerable number of feedbacks on the perception of DL from the library professionals. Some of these are as follows: “DL is a library collection that is digitally available...”, “...is a collection of documents in organized electronic form, available on the Internet ...”, “... means all collections are digitalized and accessible from anywhere in the world.”, “... is a collection of electronic documents which is accessible through Internet ...”, “A system with comprehensive collection, manage and preserve digital contents and offer access”. Some professionals mentioned the definitions stated in the IFLA/UNESCO manifesto for digital libraries. Based on our findings, we recognize that while the library professionals define DL from their own perspective, some echo the same as the literature indicated, whereas, a few of them widening the scope of the DL beyond its purpose.

In Bangladesh, we cannot simply adopt a definition articulated in another context, as the user needs and library cultures in Bangladesh are different from those in other countries. In our study, the library professionals mentioned about preservation and access to the library materials. We recognize that they considered preservation as a rule of thumb for every library, especially for archival materials, whereas access is dependent on the user community. For example, the objective of a National Archive digitization follows a more restrictive users’ access while public library allows the entire nations, and university/research organization permits only the well-defined user community. Further, DL should allow digitized contents (Born digital and converted from physical medium) and provide access to external resources (subscribed, under agreement, exchange). In general, our respondents mention that DLs should have the same purposes, functions, and goals as traditional libraries with selected and organized library object in electronic format and the contents accessible to a define community or set of communities. They also emphasized on some vital issues including subject analysis, index creation, reference work, preservation, and full-text. We should be aware that DL is too young to define in any permanent ways (Seadle & Greifeneder, 2013). Therefore, it will be better to define respective DRM system according to the functionality and services, and this should not involve fabricated information.

#### ***4.2 Institutional repository***

In the term Institutional Repository (IR), ‘institution’ refers to the library’s parent organization. The rise of the IR is an innovative form of scholarly communication within the digital environment (Crow, 2002). For scholarly communication, there are two roads to Open Access (OA): golden and green; the former allows publishing in OA journals while the latter permits self-archiving in addition to publishing in a non-OA journal (Harnad et al., 2008). Further, the self-archiving focus of the library and academic community are concerned about the library budget management due to skyrocketing prices of journal databases. In addition, researches that have been funded by public money should have free access to the public (Uddin, Koehlmoos, & Hossain, 2014). Hence,

the term IR becomes popular mostly among the academic and research libraries in the management and dissemination of scholarly materials created by the institution and its community members (Lynch, 2003; McDowell, 2007). IR ensures organizational benefits of the research works they support and fund; and make the research outputs available to the wider community. Moreover, it helps to get rid of the publisher's policy - 'produce, publish, and buy it back'. The use of IR is spreading into other types of organizations too, even discipline based, for example, 'E-LIS' for Library and information science, 'ArXiv' for Physics, 'CiteSeer' for Computer and information science, etc.

The respondents in this study expressed definition of IR as: "IR preserves institutional own publications that can easily accessible through a software", "... for preserving all intellectual publications by particular organizations as open access for sharing knowledge in the community..", "...online archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution and offers to user communities according to institutional policies...". Some definitions are too narrow based on specific type of organizations, e.g. ministry library, health library, university and research organization's libraries etc., while some others suggested to include journal articles as an IR contents. Some of the professionals mostly echo the definition stated by Johnson (2002) "IRs are a practical, cost-effective, and strategic means for institutions to build partnerships with their faculty to advance scholarly communication". We argue that depends on collection policy and technical ability (Shoeb, 2010; Chen & Zhang, 2014), an IR usually preserves peer review materials, journal articles - preprint and postprint, working papers, books, book chapters and sections, conference and workshop papers, datasets, learning objects, audio-visual materials, software, patents (Rahman & Mezbah-ul-Islam, 2014) including non-peer reviewed materials (Rahman & Bayramova, 2011) of the host organization. Further, open access IRs increase the visibility of the institution's scientific productions (Ezema, 2011).

We observed that none of the IR in Bangladesh is using Altmetrics (alternative metrics based on online activity). Altmetrics helps the organizations to show the impact of their research, contextualize the readership of an author's research output to both internal and external stakeholders, and provide a measure for scholarly works available in the Open access IR (Konkiel & Scherer, 2013; Rehemtula, Rosa, Leitão, & Avilés, 2014). The 2014 edition of the ranking web of repositories included Altmetrics as an indicator. We suggest that Bangladeshi library professionals have to be familiarized with the tools of Altmetrics as it is here to stay.

There is an open question, Can an IR be considered as a DL? Apparently, an IR and DL are two different entities. We argue that the digitization process and technical requirements to create an IR is same as a DL, and both contain full-text, not just metadata (Schöpfel, 2013). However, the resource selection, collection, preservation, and accessibility policy differ in both the cases. For example, an IR makes the intellectual output of an organization or multiple organizations or just one department or discipline freely available to the world, but in the DL, the copyright and license protected materials cannot have public access. Therefore, IR and DL differ based on the policy- which materials belong to the organizations and which are for a set of the user community. Nevertheless, the technical requirements for both are same, and DL can be regarded as an extended IR system (Fox & Sornil, 1999).

## **5. Technical Aspects**

### ***5.1 Software selection***

The survey result indicates that in Bangladesh, the libraries are developing DRM systems with open source software and a few of them are using customized (developed by them) or commercial software, while the rest is uncertain choosing the software. The majority of the libraries has conducted a library users' needs assessment, and organizational needs assessment before starting DRM system. A few of the libraries provided training to the library personnel, recruit expert library personnel or hire external expertise, for the same purpose. We found that during DRM system software selection, the libraries have given priority to library personnel's expertise, external professional expertise, and compatibility with existing software, while ignoring feasibility study and SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis.

Which software is the best for a DRM system? - We have received this question during the survey. Our simple answer is 'none'. For example, when we like to have food, we have four options: visit a restaurant and choose from the menu based on our taste (compare and choose from the available software), or look around and see what others are eating and order the same (follow what other libraries are doing and chose the suitable one), Or visit a restaurant that served the food that we like most (select the software that covers the purpose of the library), or cook at home (build your own software). Nevertheless, in all the cases, we need to consider the

purchasing power of our wallet (library budget). We argue that none of the approach is better than others. We suggest that whatever approach the libraries choose for software selection, it should begin with a feasibility study including SWOT analysis followed by detail technical and operational plan.

In the last decade, libraries introduced open source software in Bangladesh. In the beginning, it was assumed that DRM system would flourish with open source software, as the commercial software cost almost one year library budget, and even a couple of year's budget for some libraries. Moreover, there are some commercial initiatives for building DRM systems with open source software. The profit-making mentality of these organizations keeps the open source software installation cost equivalent to the commercial software. The receiver library is bound to choose the software in which the commercial organizations have expertise. There is no scope to think about the usability and adaptability with the software as the receiver libraries have very little or no expertise in the provided software. Further, these commercial organizations deliberately overlooked the comparative study of software and need analysis of the organization. They intentionally show the features and technical aspects of software about which the receiver library professionals have big doubt. These commercial organizations avoid feasibility study and SWOT analysis purposefully, too. It is like serving fish to eat rather than teaching how to catch fish. These commercially minded entities are an obstacle in choosing required software that best suit to the receiver library needs and development of tech-expert library professionals also.

One library reported that the “software itself is a problem” and another expressed, “it becomes slow day by day”, and both the libraries are using GreenStone. DSpace uses a relational database system, while GreenStone uses the file-system. The latter one stores the original document in the import folder, archive folder and index folder. Therefore, a single object occupies three times storage area than the other software, and provides proportionally slower services while the amount of digital object increase (de Smet, 2014). In addition, GreenStone does not support any persistent identification scheme, while handle.net for DSpace, URI (Uniform Resource Identifier) for EPrints and Fedora are there (Madalli, Barve, & Amin, 2012). Further, applying ‘Embedded Metadata Plugin’ into all the objects slow down largely the time needed for adding single document, even in the minimal rebuild option in GreenStone. The developers themselves know that attention has to be given to performance in larger collections (de Smet, 2014). Libraries need huge time, workforce, and monetary investment to build a DRM system. Thus, libraries should be aware that once a DRM system is set up, changing its structure takes almost the same effort to establish a new one. If the selection of the software is not done with caution, the system will be just an ‘elephant graveyard’ in the long run. Therefore, a trustworthy evaluation should be done before software selection instead of blindly following what others are doing.

## ***5.2 Metadata requirements for DRM system***

What is metadata? The 150-year old term ‘cataloguing’ or bibliographic information gets a new identity as ‘metadata creation’ in the digital age. In a sense, metadata is the life of the documents, and obligatory part of any DRM system (Rahman et al., 2011). The survey result indicates that some of the libraries are using two different metadata schemas, one for ILS and another for DRM. We found that most libraries selected metadata for ILS either based on the default setup of the software, or developed without following any International schema. On the other hand, for DRM system some libraries chose metadata schema based on the default setup of the software, while some others considered the expertise of existing and/or recruited library personnel, and a few of them focused on external expertise. There is no sign of a feasibility study or SWOT analysis for metadata schema selection. We also found that all the available DRM systems create descriptive metadata (for example, title, subject, etc.), followed by administrative metadata (access privileges, rights, ownership of material). Only a few of them considered technical metadata (information describing the production process or digital attributes of the work) too, while structural metadata (for purposes of linking different parts or units of data) is largely ignored. Adequate metadata guarantees future access to a digital object. Otherwise, the object will be non-retrievable. This will cause information loss and expensive consequence for the society (Rahman et al., 2011).

There is no ‘one-size-fits-all’ metadata schema that can satisfy different library materials and users communities (Baca, 2003). No international metadata schema can guarantee the need of the local materials (for example, manuscripts, history, culture, etc.) or meet the specific objective of the digitization project. Therefore, it is often necessary to modify the schema to best fit the library needs (Rahman et al., 2011). The libraries should first determine functions that metadata needs to serve, as there are two main criteria for metadata selection: i) the types of materials to be digitized; and ii) the purpose of the project (Beall, 2007; Lopatin, 2010).

Qualified Dublin Core is widely used in DRM system, as it is specified by the OAI-PMH (Open Archives Initiative - Protocol for Metadata Harvesting) as a ‘lowest common denominator’ format well suited to support harvesting into a commonly structured repository, and therefore, supports discovery interoperability (Jones,

2006). Some misunderstanding has been observed as some libraries indicate about using simple Dublin Core, while they are actually using qualified Dublin Core. For example, 'Date' is one of the 15 basic Dublin Core metadata elements. The 'Date' is then further specified to identify it as a particular kind of date, for example, 'dc.date.created', 'dc.date.valid', 'dc.date.available', 'dc.date.issued', 'dc.date.modified' etc. The libraries have to know what metadata schema they are actually following to maintain the standard metadata practice.

The survey indicates that a good number of libraries in Bangladesh are using MARC 21 for DRM system. However, MARC originally designed to read linearly from tape and support flat file format and thus is limited in its granularity. It also unnecessarily stretches too wide to accommodate certain other genres of information objects (Alemu, 2014). In the digital era, MARC 21 fails to represent relationship and hierarchies (Niu, 2013). Relationships help users to find and identify what they are looking for, and make them aware of other available resources that may be useful, which is the one of the main objectives of DRM systems. Because of these limitations, the libraries in the developed world are already practicing alternative of MARC 21. For example, the Dublin Core metadata standard is mostly used for describing digital materials, which is not limited by size as MARC 21, and allows repetition of the fields for certain elements, whereas, MARC 21 subfields obstruct the need for repetition (Reese & Banerjee, 2008). Library of Congress provides necessary instructions for crosswalk between core MARC 21 bibliographic data elements and elements in the Dublin Core element set in their website. Crosswalks is the most common method used to enable interoperability among metadata schema (Chan & Zeng, 2006a, 2006b; Neiswender & Montgomery, 2009). We argue that the libraries stuck with MARC 21 and/or other non-standard metadata schema should find their way towards metadata schema supporting digital materials, as well as the libraries that are in the early stage of DRM system building.

### ***5.3 Resource description and Vocabulary***

We found the libraries using AACR2 (Anglo-American Cataloguing Rules, 2<sup>nd</sup> edition) even in the digital environment irrespective of metadata schema. In general, MARC goes with AACR2 for traditional library catalogue. However, RDA (Resource Descriptor and Access) has been developed as a replacement for AACR2 to use in the digital environment and remove the Anglo-American prejudice (McCutcheon, 2012). RDA is a content standard, not a display standard, and has clear line of distinction between recording of data and presentation of data that better suited to a digital environment (Chapman, 2010). Moreover, RDA is based on the IFLA metadata models Functional Requirements for Bibliographic Records (FRBR) and Functional Requirements for Authority Data (FRAD), and uses the language and terminology of FRBR and FRAD (IFLA, 1998; Patton, 2009; Dunsire & Willer, 2011). The FRBR model consists of entities, relationships, and attributes used to describe resources for how to display bibliographic data for access and retrieval by the user, while FRAD defines entities such as name, identifier, rules, agency, controlled access point, attributes (descriptions) and relationships (Tillett, 2007). Relationships help users to find and identify what they are looking for, and make them aware of other available resources that may be useful. For example, author, illustrator, producer, composer, conductor, translator, and others may be used with names to show the relationship of the person to the resource, whereas adaptation of, translation of, paraphrases of, based on, remake of, etc. may be used to show the relationship of one resource to another resource.

We should be aware that currently, Metadata standards for DRM system have been expressed using XML (Extensible Markup Language), which is easy to store, read, update, and share. New technologies are expanding the way of data storage with and about digital object, using the Resource Description Framework (RDF) to construct relationships, descriptions, and digital objects that are more semantically connected to the web (Pan, 2009). RDF has become a W3C (World Wide Web Consortium) standard for encoding knowledge in the semantic web (Soundararajan, Meenachi, & Baba, 2010). When selecting vocabularies, the aspect of semantic information should be given emphasis (Neiswender & Montgomery, 2009). The standard and internationally accepted vocabularies should be considered as a point of reference for indexing subject information. Moreover, Linked Data (expressed in SKOS, Simple Knowledge Organization System) provides benefits for libraries. The library resources index are automatically linked if the thesauri are linked (Caracciolo et al., 2011). New standards are replacing the olds, and keeping pace for digital collection building. Therefore, the libraries at their early stage of DRM system should follow the new resource description framework rather than old one, and the libraries that have already implemented DRM system should find their own way to adapt the new standards.

### ***5.4 Digital objects building***

We found that libraries are preserving both born digital and digitized materials including, book, book chapters, thesis, journal published by the organizations, organizational newsletters, manuscripts, images, newspaper articles, preprint and postprint of articles, annual report, organizational magazine, old question papers, protocols,

scientific reports, bibliographies, abstracts, letters, conference proceedings, monographs, audio-visual materials, reports and some other materials without research value. The libraries give priority to born digital materials than digitally converted objects, and their main concern is to journals, e-books, and thesis databases. The university libraries emphasize on digitizing thesis, reports, and newspaper articles. In all these cases, there is an attitude to provide access to the resources freely (no direct cost) available in the internet and linked those to the either ILS, or library website or in the DRM system. The majority of the libraries has less materials to digitize, whereas, Old public universities, National library, National Archives, National Museum, and Public library preserve a huge collection of archival materials, historical documents, cultural documents, 100 or more years old books, pamphlets, manuscripts that are in the urgent need of digitization.

Currently, a few libraries subscribe e-books databases. However, some of these libraries often miss to distinguish between an e-book and a book as a single PDF file. A book can be digitized in PDF, but an e-book includes some functional utilities such as search and cross reference functions, hypertext links, bookmarks, annotations, highlights, multimedia objects, interactive tools (Vassiliou & Rowley, 2008; Velagić, 2014; Maceviciute, Borg, Kuzminiene, & Konrad, 2014). E-books are made accessible with the help of appropriate devices (D'Ambra, Wilson, & Akter, 2013) including PCs, PDAs, blackberry, pocket PCs, tablets, mobile phones, iPods, etc. Each format has its own features and specific reader software is needed to enable the e-book to be read or viewed on a device. A major advantage of DRM is that multiple users can access the same e-book simultaneously round the clock. Sometime, copyrighted materials (e.g., e-books) have a license for 'lending out' only one copy at a time. Digital right management system ensures the access of a resource for a specific period (equivalent to returning the resource in a traditional library) to a user (Zhang, Zhang, & Zhao, 2014). The Digital right management system is not implemented by any DRM system in Bangladesh until now.

### ***5.5 Collection builds up, Access right, and copyright issues***

The survey indicates that half of the libraries digitize objects by themselves (in-house), while one-fourth of the libraries using both the in-house and outsourced to vendors approach, and only a few of them fully depend on vendors. However, it is surprising that the majority of them has not sought permission from the creator/s of the material before digitization, while only a few have mentioned that they follow the proper procedure to obtain creator/s permission. Furthermore, some IRs are not conscious about the preservation and access to preprint and postprint version of journal articles. Some journals have an embargo on hosting preprint and postprint, but the libraries are not aware about those, and thus run the risk of violating copyright act. In addition, libraries sometimes download open access materials from the Internet and add to own collections, which is a total violation of intellectual property act and the copyright act, too. The libraries are acquiring Simple text/Microsoft Office formats/Open Office formats, Encoded text (blogs, websites, PDF documents), Photography or other still images (JPEG, TIF, PNG, GIF, etc.), and acquiring Licensed e-books (XML format), Non-licensed e-books (XML format), Digital video (mpeg, 3gp, mp4, flv, etc.). None of the libraries focused on preservation of 'Research data' and 'Geospatial data', while Borgman et al., (2015) argued that DLs was planned with documents as a content, but it has expanded its area for multi-media contents and research data.

There are some misconception between access right and collections building. Libraries pursue to collect, preserve, and provide access to materials in print and other physical and electronic formats to support the users' community. Libraries have to acquire library materials and add them to a permanent collection to build a collection. While for access right, libraries need to subscribe or make an agreement with the host organization for exchange and share, and obviously should not claim as a collection rather than subscribed materials. We found some libraries not being aware about the visible difference between access right and collection build up. For example, one university claimed 44,000 E-book as their library resource (British Council, 2015b), which is a fabricated information. In Bangladesh, no library has the capacity to hold such amount of e-books until now. The libraries must not claim an object as a library resource while they either subscribe or have only free access (no direct costs to acquire, access, read, copy, or use). Moreover, a library must not count free access to any database (e.g., e-books by Gutenberg project) as its own resource.

### ***5.6 Federated search and user interface***

The survey indicates that half of the libraries prefer to provide open access, but some of the materials are only for registered users, while some libraries are strict to make the resources available only through the Intranet. Some of the libraries maintained separate web page for subscribed online databases, and provide access through the IP login or remote access management system, e.g. MyAthens, EZproxy while some libraries provide access to subscribed journal and e-book databases through the DRM system. The survey also indicates that the libraries have OPAC, dedicated webpage with a list of subscribed e-resources, Institutional repository, and even full text

collections. Some of the libraries have an access interface based on collection, for example, thesis paper, internship report, e-book collection, etc. From the library point of view, we cannot expect that users have to know the location of required information in a specific subset (physical library catalogue, IR, Journal Database) of collection, and search there. Some libraries have apparently combined, but use separate tabs for each subset of the collection, while some keep the search interface in a scattered way. Each of the access point has its own approach, and a user loses the point of start to find the right information and is likely to give up before knowing the right resources, though the library have more relevant resources for the user.

A user cannot read what a user cannot find (Rahman, 2012). If users cannot locate desired items by search, they have to spend an enormous amount of time to search for related items, and certainly miss many items because of the ineffective and inefficient search facility. We argue that users do not judge the library service with its huge amount of collection or access policy rather how the library can satisfy their specific information need. Users usually search for information not for collections, and rarely know in which collection s/he might get the desired information. Sometimes, libraries put much attention to information-centered approach rather than a user-centered approach, and overlook the characteristics, needs, and approaches of the users. A user centric system should not be designed by ignoring the users' perceptions (Rahman, 2012). It is a total failure of the entire system if federated search (federated information retrieval or distributed information retrieval) is absent. Any library with multiple searchable databases can apply federated search techniques, where queries likely to return relevant answers by searching a subset of collections and merged into a single file (Shokouhi & Si, 2011). It is important for the libraries to learn more about non-users in order to make a DRM system attractive to all potential users (Monopoli, Nicholas, Georgiou, & Korfiati, 2002). Otherwise, a huge number of potential users may not use them.

### ***5.7 Virtual reference service***

Librarians have been providing reference services since the early 1900 (Stabler, 1993). A DRM system allows users for remote access to the library collections, but it does not minimize the consultation of library professionals, reference services, consultation with subject librarian, and a place to meet with peers and the research community, too. A DRM system is not only a collection of documents in well-organized electronic form (Borgman, 1999; Chowdhury & Chowdhury, 2002), but also a platform for users' communication, e-learning and e-research (Lankes, 2011). Today's libraries are developed to meet the user needs to remain effective, and initiate the reference services via email, chat, web-based inquiry services, social networking tools, etc. These efforts expanded the traditional core reference function of the library from the reference desk to the desktop. Users prefer virtual reference services as it is quick, convenient, reliable, require less time for interactions and efficient (Connaway & Radford, 2011), and feel more comfortable since it is an anonymous environment (Mu, Dimitroff, Jordan, & Burclaff, 2011; Yilmaz, 2012). If a DRM system is a simple place to get publications and stuff of others, and not a place to create and to gain access to the rest of the community, the value of the DRM system is nothing but a virtual entity (Lankes, 2012).

We found a big gap in virtual reference service. The majority of the libraries while expecting the user to have remote access to the materials, ignoring the users' need such as virtual reference service, consultation with subject librarian, or ask a library professional for clarification about a topic. Some of the libraries consider their email, Facebook, Twitter as a virtual reference tool. We argue that these tools can be considered as a means of communication with users as long as it is clearly mentioned in their web appearance. Two universities have claimed of implementation of virtual reference services, and stated a specific hour during the day for the service, but they are actually not providing any service. We have observed the services continuously for four weeks and found both of them inactive. Libraries should provide virtual reference service having library professionals online for the entire opening hours.

### ***5.8. Digitization Policy and Procedure***

The survey indicates that none of the libraries have well documented in the DRM system. A DRM system should have a well-written policy and procedure for the respective organizations. It helps the system to run smoothly and to avoid any unforeseen situation well in advance. The most common phenomenon of the expert library professionals is to switch organizations for the advancement of career. When a professional leaves the organization, s/he carries out tacit knowledge and only can leave behind the explicit knowledge through documentation. Without documentation, the successors need to make a fresh start that is a direct hindrance towards the library's growth. In addition, there is a significant need of knowledge management system among the library staff to protect and share the intellectual outcome within the library.

A well-written policy and procedure addressing the DRM system is essential. A written policy provides a set of rules and guidelines for decision-making in routine situations and speed up the work process to achieve the goal. It is logical that many unwritten rules made up by the staff to avoid a crisis, but typically, these are incomplete, inconsistent, or unnecessary because there is no predominant policy to provide guidance. As a result, the daily operations go in unexpected ways and give the foundation of failure. The survey found an incredible number of libraries without written policy. However, some of the libraries that established DRM system have emphasized on written policy about 'mission and goals', 'collection development', 'preservation', and only a few of the libraries focused on 'rights and licensing' and 'emergency preparedness'.

## **6. Obstacles in Building DRM System**

The obstacles faces by the libraries for implementing the DRM system are reasonably similar. We have clustered the survey feedback as follows:

### ***6.1 Administrative non-cooperation***

The parent organization's highest authority fails to understand the importance of the library and its digitization. Sometimes non-cooperation from the management and administration level is also there. The first problem is explicit while exploring the organizational websites with an absence of a dedicated library website and the name and contact addresses of the library personnel. It indicates how much negligent the authority is towards the library.

An equal web visibility of the library personnel has to ensure by the library in comparing to the other department/section of the organization. Library professionals need to take the challenge to raise the reputation of the library to the respective highest authority by themselves, as no other internal or external sources will do the same. Library professionals need to make strategic planning and put light on the ignorance of the higher authority where applicable. In addition, libraries have to arrange a regular user-training program to make the users aware about the DRM system. Users' demand for library development will play a key role to convince the concerned authority.

### ***6.2 Absence of organizational policy***

Organizational policy for DRM system is highly essential for successful implementation of the same. There is an absence of parent organization's policy for library digitization. Therefore, the primary goal of digitizing, selection of object, authentic and trustworthy digital replacements of original source material, access right, sustainable digitization, life cycle of digital objects, maximum use and reuse of digital object, third parties use, planning and management, etc. are not available in a written form. Moreover, digital preservation policy, metadata policy, collection development policy are not available.

Parent organizations' policy documents should mention clearly and elaborately about its library digitization policy. The libraries need to suggest the parent organization for the development of library digitization policy. Libraries should develop their digitization policy for their own sake, if the parent organization does not take any initiatives for the same. Nonetheless, a well-planned project and feasibility study and SWOT analysis are obligatory in advance. The library should understand what kind of library materials it has and what will be added to its collection, who are the user, and develop policy documents and guidelines accordingly. Having a well-planned and well-equipped DRM system may be time consuming, but will lead to the right way to reach the goal.

### ***6.3 Human resources and training***

Shortage of technically sound library professionals is widely reported. Sometime the existing manpower has inadequate knowledge about DRM system, while some professionals do not apply the knowledge acquired from the training programs and stay beyond professionalism. A good number of training programs have been arranged for the library professional in the last eight years, but the numbers of existing DRM systems are proportionally very small considering the number of trainees. The practical reasons are either the trainings were not appropriate enough to train the professionals or the trainee's organizations were not in a position to initiate a DRM system. In some cases, advance level training is not fruitful when the required access and technologies are not available in the libraries. In addition, the number of experts did not increase as expected due to less focus on the digital library education. Although, the NSU library offers 14-week long training program on Digital and Online Librarianship since 2004 (Rahman, 2015). The department of Information Science and Library

Management of University of Dhaka introduced a 100-marks course on digital library at post-graduate level (course no. 501) from the academic session 2010-2011 (University of Dhaka, 2011). University of Rajshahi offered a 50-marks course at both post-graduate (course no. 507) and graduate level (course no. 105) from the academic session 2012-2013 and 2013-2014 respectively (University of Rajshahi, 2012, 2013). All these courses concentrate on introductory level of digital library only, while the professionals already involved in the digitization process long before.

There is no immediate solution other than nominating staffs for training who have dedication to establish a DRM system and recruit expert professionals to succeed in the DRM system implementation program. There is an immense need to focus on digital library education. Educational organizations that involve in library education should conduct a survey to determine the required type of personnel to administer digital libraries in Bangladesh (Rahman, Khatun, & Mezbah-ul-Islam, 2011) and should offer in-depth courses on digital library management (Myburgh & Tammaro, 2013). Moreover, these educational organizations should introduce well-designed full-fledged master degree program on digital library taking into account the technological advancement. At the same time, motivating the library staffs is highly essential. Obviously, neither a library nor a DRM system is a one-man show. It requires a dedicated expert team for the DRM system and sophisticated technologies to start the program.

#### ***6.4 Infrastructure and technical support***

We found that library teams operate none of the DRM system entirely. The IT department of the parent organization administers network support, file management and storage, backup and disaster recovery, centralized hardware and software acquisition and maintenance, security and protocols (authentication, authorization, etc.). Some of the self-motivated library professionals acquired knowledge in IT, too. However, there is always conflict between the library oriented IT professional, and the IT professional who are responsible for the entire organization's IT support. In addition, some libraries reported about the poor internet speed, ineffective IT structure of the entire organization, and obsolete software and devices as an obstacle for the development of DRM systems.

The solution involves recruiting dedicated IT professional in the library team and/or ensuring some dedicated support-hand from the IT infrastructure of the parent organization. The technology changes rapidly. Today's technology will become obsolete tomorrow (Calvert, 2014). The old-fashioned software and hardware should be replaced and compatible equipment should be managed. Computerized systems are more dynamic rather than static. Therefore, proper selection of devices and software that are adequately flexible to meet both the present and future needs is required.

#### ***6.5 Budget constraints***

Insufficient library budget is another obstacle. The majority of the libraries' DRM system development is supported by the organizational operating budget, while only a few have managed grants from donor agencies or government. It is very difficult to manage sufficient allocation of budget for the development of DRM system from operational budget. Sometimes, the parent organization cuts its library budgets in the middle of a financial year to support other departments, and does not do otherwise.

Libraries need to plan and pursue for sufficient budget allocation from the parent organization. There is no easy solution to recover budget limitation. The libraries need to create awareness among the respective highest authority and make them understand about the intangible value of library and recognize its contributions to value creation (Kostagiolas & Asonitis, 2008, 2009). Dynamic leadership is required to influence the top management to stop budget cuts. Concurrently, libraries should seek opportunities for external funding to build DRM system.

### **7. Considering Factors for DRM System Development**

Before jumping into any DRM system development, it is essential to think about required information architecture, software, metadata schema, preservation, design, evaluation, funding, compatibility and integration in the existing library structure (Arms, 2000; Schwartz, 2000; Tedd & Large, 2004). To preserve a digital scholarly record, libraries need to follow best practices for preservation. Libraries should be aware that illuminated manuscripts lasted for over 1000 years, but CDs degrade in 15 years (Li & Banach, 2011). Moreover, technological obsolescence is a bigger threat than deterioration of storage media (Jackson, 2012). Therefore, libraries need to consider a number of factors before starting any DRM system. Technical knowledge

and expertise are required to evaluate these factors. To provide a preliminary idea, we have listed some of the major factors below:

#### **Plan and Policy**

Feasibility study with SWOT analysis  
Organization's needs assessment  
Users need assessment  
Clear mission, goal and purpose  
Planning – short term, long-term  
Preservation policy  
Organizational and library policy  
Road-map for completion of phases

#### **Budget**

Cost modelling  
Cost benefit analysis  
Budget distribution

#### **Manpower**

Strategic human resource management  
Proper training for library staffs  
Recruit expert professionals

#### **Technical issues**

Software selection  
Metadata management  
Vocabulary, Resource descriptor selection  
Types and format of materials  
Storage media, Back-up and security  
Share and reuse techniques  
Collaboration techniques  
Disaster management system  
Security against hacking & sabotage

#### **Collection**

Estimation of own collection  
Selective collection development  
Access to subscribed databases  
Copyright rights and licensing issues

#### **Users**

User education and training  
Information marketing  
E-learning module for users

In addition, the libraries that plan to digitize their own collections may attend the following questions (not limited to) as a starter for digitization program:

- Do we have resources set aside for ongoing long-term storage of digital objects?
- Are our objects unique?
- Do the objects have representative value?
- Is there a sufficient context surrounding our digital objects to make the collection usable?
- What are the main issue underlying the transformation from print to digital format?
- Do the users have demand for the digital version rather than the print version of the material?
- Do our objects have appeal to specific scholarly communities?
- Do we have evidence that the user community would use digital objects?
- Will digital objects reach new audiences?
- Will digitization help previously known audiences access our items, when they could not access them in the physical versions?
- How the digital objects will be discovered?
- Will we use the equipment compatible with the upcoming technologies?
- Do the materials have special characteristics that require special processing during digitization that would increase the cost?
- Do we have sufficient resources, both in money and in personnel to devote to digitization?
- Will we be able to digitize objects with sufficient quality?
- Will the digital objects add value, e.g., keyword search ability for textual materials?
- Will we give priorities according to the users need or do it randomly?
- Do we have a collection policy that will inform digitization selection decisions?

We suggest that libraries should ensure proper planning and resource gathering (expert manpower, budget, technology) before the start of the digitization program. It is better to make a plan ahead and build the DRM system to the end, and collaborate with others. Since nobody wants a vanishing DRM system.

## **8. Suggestions for Collaboration Plan**

The initiatives of DRM systems are going on in the scattered way in different corner of Bangladesh. The libraries are doing their best according to their level of understanding in the absence of national standards and guidelines. There are no two libraries those follow the same policy for DRM system. In one hand, the libraries are enjoying their freedom for the same aim, but in diverse ways. On the other hand, the absence of national level initiatives and guidelines are hindrance to encourage other potential organizations to join in the

momentum. In the long run, these libraries will stand as an island without a boat. Currently, the libraries are serving community based. Therefore, users of that particular community are getting support from the particular library and significantly not from all the libraries. Obviously, some libraries are digitizing same materials simultaneously, and that is a clear waste of national resources. These problems can be solved with a collaborative DRM system.

The respondent libraries reported that they are willing to join in a collaborative digital preservation with similar kind of libraries, while a few of them have a plan for National level collaboration of digital resource management. Since libraries do not perform in harmony, a big project that includes a large number of different types of libraries may return the unfortunate history of BANSLINK. The libraries need to take the first step immediately to reach a hundred mile away goal. We suggest that there should be two short-term and two long-term plans as depicted below:

Firstly, any advance level research library can take a 'one to one' collaborative initiative; create policy paper, short term and long-term planning, and management. They should also gather experience from their trial and error, and make a common platform for the different organizational culture. This will allow similar types of libraries to join in the collaborative DRM system progressively. Together they can set national standard and develop guidelines for other libraries to fulfill to be a member of the collaborative system, and extend their hands to increase the number of members.

Secondly, as a good number of university libraries are implementing DRM systems, UGC of Bangladesh can take an initiative for collaboration among them. Similar steps can be followed as proposed for the research libraries. UGC may consider a couple of progressive university libraries in the initial stage, set guidelines for themselves, and encourage other university libraries to fulfill the requirements to join as a member. This approach will bring long-term success and create a national standard for university DRM system steadily.

The above-mentioned approaches will bring research and university libraries under respective platform. It will minimize the duplication of digitization work, create a national standard, and allow library users to access to all the member organizations DRM systems from a single federated search interface. Nonetheless, other organizations (public, national, international, etc.) with DRM system will remain out of the scope of the above mentioned research, and university library collaboration.

Therefore, as a third step, there should be a national level collaboration to bring all the libraries with DRM systems under an umbrella. It may be named as a Bangladesh Digital Library. It should have a provision to include new libraries' DRM systems when they are ready. The National Library of Bangladesh may take the lead role and work closely with the library professional bodies like BALID and LAB (Library Association of Bangladesh) to materialize such initiatives. In addition, necessary steps should be taken to make these digital resources available on the doorstep of the people by establishing Community Library and Assembly Centre in rural areas in the country.

Fourthly, when the libraries will accomplish national level collaboration with DRM system, the National library may play the key role to establish an international collaboration. An initiative can be taken to establish 'Asian Digital Library' following the model of the European library (an aggregator), which provides access to the resources of 48 National Libraries of Europe and leading European research libraries (European Library, 2015).

All the above proposals include decentralized development approach. The parent organizations have more authority and responsibility for the development of the DRM system and share the same at the national level, and the central management authority will ensure the access right, responsible for policy and guidelines development, and quality control. To materialize the above proposals, proper planning, policy and guidelines development, and adequate fund will be required. If the above proposals are materialized, it will be the best contribution from the library professionals to achieve the 2021 vision of Digital Bangladesh for which we have five more years in hand.

## **9. Conclusion**

The library sector and the library professionals of Bangladesh have made a remarkable progress in the last decade despite of many visible obstacles. The google is used for a variety of purposes nowadays. However, accessing information from a legitimate source or publisher comes at a cost for the user. The DRM system brings this access to the users and ensures the authenticity of information. The libraries are developing DRM systems to facilitate their users. The purpose of DRM system in libraries should be to establish new services and

ways of discovering and accessing knowledge rather than a static access interface to digital resources. Digitization of material is just a small percentage of digitization project activities, while the libraries are ignoring the licensing and negotiation of e-resources, monitoring and evaluation of digital library, disaster management, in house and remote access, staff training, user training, etc. The libraries need to follow a standard metadata schema to describe their digital resources. The libraries should ensure maximum use of their resources through the federated search interface, and provide virtual reference service. The libraries that are in the early stage of developing a DRM system have to develop proper plan and road maps to reach their goals. The libraries that have already implemented DRM system should follow the international standard in all aspects. In both the cases, there is a high need to develop organizational and library policy for digitization. Nonetheless, the libraries have to take initiatives to create awareness among the users and encourage using the DRM system. Without proper awareness, users will not be able to prompt on their need, and all the efforts will be fruitless.

The collaborative effort will bring all the DRM systems under a single interface. This will provide direct benefit to the users' community who are the main target of any digitization program. Moreover, this effort will create a national standard of digitization and bring harmony among the libraries. The libraries who are in the initial stage will be encouraged to develop their DRM system following national standard and their path will be much easier than current individual practices. BALID should focus on training about the new standards, for example, Dublin core and other metadata schema that sufficiently describes digital objects, RDA standard, RDF data model, FRBR and FRAD model for the library professionals. The earlier the library professionals embrace these internationally recognized standards, the quicker they can implement these in building DRM systems. We observed scarcity of research on DRM systems in Bangladesh. The majority of the available researches is mostly descriptive and quantitative in nature and largely focuses on theoretical aspects. The professionals should focus on the qualitative and analytical research that can show the way to the library development in Bangladesh. Moreover, researches are needed to identify the impact on the library users and how scholarly community is influenced before and after DRM systems. We expect the future generation librarians to conceptualize their mission in the digital world.

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## Survey on Digital Resources Management in Libraries 2015

(Online questionnaire for the Heads of libraries)

What is the name of your organization/institution/University?

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Please provide the e-mail address of the Head of the library

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Does your library have a digital resource management system (including institutional repository)?

- Yes
- Work in progress
- No

If No is selected, Then Skip to End of the Survey

1a) The Integrated Library System of your library belongs to

- Open source software
- Customized software
- Commercial software

1b) Which software are you using for Integrated Library System?

If 1a) Open source software Is Selected, show

- |                                 |  |
|---------------------------------|--|
| <input type="radio"/> KOHA      | <input type="radio"/> SLiMs                        |
| <input type="radio"/> WIN/ISIS  | <input type="radio"/> ABCD                         |
| <input type="radio"/> ABCD      | <input type="radio"/> OpenBiblio                   |
| <input type="radio"/> Evergreen | <input type="radio"/> Others, please mention _____ |

If 1a) Customized Software Is Selected, show

Please mention the name of the Customized software \_\_\_\_\_

If 1a) Commercial software Is Selected, show

Please mention the name of the Commercial software \_\_\_\_\_

1c) Please mention the year of launching the Integrated Library System at your library \_\_\_\_\_

1d) Which metadata schema are you using in the Integrated Library System?

- |  |  |
|--|--|
| <input type="radio"/> Simple Dublin Core                                 | <input type="radio"/> EAD (Encoded Archival Description) |
| <input type="radio"/> Qualified Dublin Core                              | <input type="radio"/> MARC21                             |
| <input type="radio"/> AgMES (Agricultural Metadata Element Set)          | <input type="radio"/> Locally developed schema           |
| <input type="radio"/> METS (Metadata Encoding and Transmission Standard) | <input type="radio"/> None of the above                  |
| <input type="radio"/> MODS Metadata Object Description Schema            |  |

2a) The digital resource management system (Including institutional repository) of your library belongs to

- Open source software
- Customized software
- Commercial software

2b) Which software are you using for digital resource management?

If 2a) Open source software Is Selected, show

- |                                 |  |
|---------------------------------|--|
| <input type="radio"/> DSpace    | <input type="radio"/> SLiMs                        |
| <input type="radio"/> OMEKA     | <input type="radio"/> EPrints                      |
| <input type="radio"/> FEDORA    | <input type="radio"/> GreenStone                   |
| <input type="radio"/> Evergreen | <input type="radio"/> Others, please mention _____ |

If 2a) Customized Software Is Selected, show

Please mention the name of the Customized software \_\_\_\_\_

If 2c) Commercial software Is Selected show

Please mention the name of the Commercial software \_\_\_\_\_

2c) Please mention the year of launching the digital resource management system at your library. \_\_\_\_\_

**2d) Which metadata schema are you using for digital resource management?**

- Simple Dublin Core
- Qualified Dublin Core
- AgMES (Agricultural Metadata Element Set)
- METS (Metadata Encoding and Transmission Standard)
- MODS Metadata Object Description Schema
- EAD (Encoded Archival Description)
- MARC21
- Locally developed schema
- Others, please mentioned the name \_\_\_\_\_

**2e) The metadata schema has been selected based on the (Multiple answer possible)**

- Default setup of the software
- Compatibility with other software
- Feasibility study
- SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis
- Feasibility study, including SWOT analysis
- Library personnel's expertise
- Recruit expert library personnel
- External expertise
- None of the above, please mention the reasons \_\_\_\_\_

**2f) What types of metadata do you create for the digital collections? (Multiple answer possible)**

- Descriptive metadata (for example, title, subject)
- Technical metadata (information describing the production process or digital attributes of the work)
- Administrative metadata (access privileges, rights, ownership of material)
- Structural metadata (for purposes of linking different parts or units of data)
- None

**3a) Does your library have a WRITTEN POLICY that addresses digital resource management in each of the following areas?**

	YES	Under Processing	NO
a) Mission and goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Collection development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Emergency preparedness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Preservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Rights and licensing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3b) Does your library have a WRITTEN PROCEDURE that addresses digital resource development in each of the following areas?**

	YES	Under Processing	NO
a) Mission and goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Collection development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Emergency preparedness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Preservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Rights and licensing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3c) Do you have IT SUPPORT for the following areas in the library?**

	YES	NO
a) Network support	<input type="radio"/>	<input type="radio"/>
b) File management and storage	<input type="radio"/>	<input type="radio"/>
c) Backup and disaster recovery	<input type="radio"/>	<input type="radio"/>
d) Centralized hardware and software acquisition and maintenance	<input type="radio"/>	<input type="radio"/>
e) Security and protocols (authentication, authorization, etc.)	<input type="radio"/>	<input type="radio"/>

**3d) Do you use the following IT APPLICATIONS for digital resource management in your library?**

	YES	NO
a) Digital imaging (for example, scanning, direct digital capture, digital photography)	<input type="radio"/>	<input type="radio"/>
b) Collection management system	<input type="radio"/>	<input type="radio"/>
c) Backup and disaster recovery system	<input type="radio"/>	<input type="radio"/>
d) Digital asset management system	<input type="radio"/>	<input type="radio"/>

**4a) What types of digital preservation are prioritized in your library?**

- Born digital materials
- Digitized materials

**4b) How do you digitize your library collections?**

- In-house
- Outsourced to vendors
- In-house and Outsourced to vendors

**4c) What types of organizational materials do you digitize? (Multiple answer possible)**

- Book
- Thesis
- Journal published by the organization
- Organization's newsletter
- Official documents
- Reports
- Maps
- Manuscripts
- Images
- Newspaper articles
- Others, please mention \_\_\_\_\_

**4d) Do you seek copyright permission from the creator/s before digitization?**

- Yes
- No
- Sometimes
- Not Applicable

**4e) To what kind of subscribed materials do you give access through digital resource management system?**

- E-book Database
- Thesis Database
- Journal Database
- Others, please mention \_\_\_\_\_

**4f) To what kind of Open Access (Freely available in the internet) materials do you provide access through digital resource management?**

- E-book Database
- Thesis Database
- Journal Database
- Others, please mention \_\_\_\_\_

**4g) Which of the following formats of born-digital resources are created or acquired by your library? (Multiple answer possible)**

	Creating	Acquiring	Not applicable
i) Simple text / Microsoft Office formats / Open Office formats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ii) Encoded text (blogs, websites, PDF documents)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iii) Licensed e-books (XML format)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iv) Non-licensed e-books (XML format)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v) E-journals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
vi) Photography or other still images (JPEG, TIF, PNG, GIF, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
vii) Digital audio (mp3, avi, wma, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
viii) Digital video (mpeg, 3gp, mp4, flv, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ix) Art or visual materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x) Research data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
xi) Geospatial data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
xii) Other numeric data sets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5a) How open is your digital resource management system?**

- Only accessible through Intranet
- Open to the world
- Open only to registered user
- Open to the world, but some materials are for registered users only
- Others, please mention \_\_\_\_\_

**5b) The subscribed online databases are accessible through the:**

- Descriptive metadata (for example, title, subject)
- OPAC only
- Library website only
- OPAC and the library website
- Others, please mention \_\_\_\_\_

**5c) The digital resources are accessible through the**

- Descriptive metadata (for example, title, subject)
- OPAC only
- Dedicated interface only
- OPAC and the dedicated interface
- Others, please mention \_\_\_\_\_

**5d) Which of the following activities have been conducted by the library before starting the digital resource management system? (Multiple answer possible)**

- Organizational needs assessment
- Library users' needs assessment
- Feasibility study
- SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis
- Feasibility study, including SWOT analysis
- Provide training to the library personnel
- Recruit expert library personnel
- Hire external expertise
- None of the above

**5e) The digital resource management software has been selected based on the (Multiple answer possible)**

- Feasibility study
- SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis
- Feasibility study, including SWOT analysis
- Compatibility with other software
- Library personnel's expertise
- Recruit expert library personnel
- External expertise
- Others, please mention \_\_\_\_\_

**5f) What are the sources of funding for the digital resource management initiative? (Multiple answer possible)**

- Organization's operating budget
- Grants
- Fees from activities
- Fundraising
- Sales of products associated with digital collections
- Others, please mention \_\_\_\_\_

**5g) Please indicate whether the following statements are true or false according to your library.**

	<b>True</b>	<b>False</b>
i) The library uses OCR (Optical character recognition) conversion of images of typewritten or printed text into machine-encoded text.	<input type="radio"/>	<input type="radio"/>
ii) The library organizes training programs for the Library personnel to use the digital sources.	<input type="radio"/>	<input type="radio"/>
iii) The library arranges training for the user community to use digital resources.	<input type="radio"/>	<input type="radio"/>
iv) The library conducts market promotion about the digital resources and services among the user community.	<input type="radio"/>	<input type="radio"/>
v) The library maintains a Twitter account.	<input type="radio"/>	<input type="radio"/>
vi) The library maintains a Facebook account.	<input type="radio"/>	<input type="radio"/>
vii) The library provides virtual reference services.	<input type="radio"/>	<input type="radio"/>
viii) The library has an online learning module for the user community about the use and access to the digital resources.	<input type="radio"/>	<input type="radio"/>
ix) The library has a plan for collaborative digital preservation with similar kind of libraries.	<input type="radio"/>	<input type="radio"/>
x) The library has a plan for National level collaboration of digital resource management.	<input type="radio"/>	<input type="radio"/>

6a) How would you define your organizational digital resource management system?

6b) What are the top five obstacles you have faced during digitization of the library resources?

6c) Please mention a definition of digital library which you prefer most.

6d) Please mention a definition of institutional repository which you prefer most.

7. Please provide any suggestions/comments that you think relevant for the current situation and/or future direction of digital resource management in Bangladesh.

**(Online questionnaire for the library professionals)**

Q1. Please mention a definition of digital library that you prefer most.

Q2. Please mention a definition of institutional repository that you prefer most.

Q3. Please provide any suggestions/comments that you think relevant for the current situation and/or future direction of digital resource management in Bangladesh.

# North South University Library Management System: Experiences of customization in library automation and digitization

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**Abstract:** The purpose of this paper is for sharing experiences of customization of web based bilingual Library Management System of North South University which has been functioning around one and a half decades smoothly. The evaluations of library management system, incorporation of various modules as per requirements of the users, overcome various obstacles and details of different functionality of the system have been discussed. Some important modules have been included as it is in the paper for visual presentation.

## 1. Introduction

North South University (NSU), the first private university in Bangladesh, was established under the Private University Act (PUA-1992, amended in PUA-2010) in 1992. Since then the NSU library originated with the latest information technology based system and services and now has become one of the best university libraries in the country. The NSU Library led off its services to users with around 10,000 books and 2 PCs in 1993. It got internet connection in 1994 and started to develop bibliographic databases by CDS/ISIS (Computerized Documentation System/ Integrated Set of Documentation Systems) software in 1995. Commercial Library Automation Software developed by a Bangladeshi software company was installed in the NSU Library in 1996 which was replaced by customized NSU-Library Management System (NSU-LMS) in 2002.

**Vision of the Library:** The NSU Library will be a world-class academic and research library and remain as a national leader in the integration of information resources, services and technology in ideas and knowledge.

**Mission of the Library:** The NSU Library facilitates access to world's intellectual contents and supports academic collaboration in teaching, learning and research that connect NSU to global knowledge and new ideas.

## 2. Facilities of the Library

The NSU Library is the first fully automated university library in the country using customized Bi-lingual system NSU-LMS, accustomed by NSU Library, which supports MARC21, web-based online lending and receiving, browsing bibliographic databases of books, a-v materials, journals, newspapers and magazines, searching full-text online books, journals and theses, creating digital repositories, auto email alert services, online membership, possess records of all operation and activities of the library system including functions of RFID Self-Check and Book-Drop etc. The users can also administer their borrowing status, renew borrowed resources and reserve three books at a time for 48 hours remotely through its own website <http://library.northsouth.edu>. This is the only university library in Bangladesh where the Library of Congress Classification System is being used to organize and arrange books, reports, journals and other resources. It also uses federated search engine Knimbus and providing facilities of plagiarism checking portal Turnitin for enhancing quality of education and research.

The library has introduced state-of-the-art technology Radio Frequency Identification (RFID) Based fully automated Library Management System for the first time in the country in 2012, financed by the World Bank and the University Grants Commission of Bangladesh under the Higher Education Quality Enhancement Project (HEQEP).

The library consists of six floors with over 70,000 sq.ft. area and can accommodate over 1,400 students at a time in its well-furnished reading rooms. The Wi-Fi and broadband internet connection of the library building help the library users to access online resources easily. Additionally, it maintains a cyber and audio-visual center equipped with 50 brand computers with Wi-Fi and broadband Internet connection and also donned with 30 computers in its various floors to use online resources. All students, faculty members and staff members of the university can browse, download and print materials from these computers free of cost. On an average 2,500 users use the library every day.

## **2.1 Resources**

A total of around 45,500 books, reports, 6300 bound journals and magazines, over 50,000 online e-books, around 40,000 online journals, 380 theses, 2,190 CD ROM books and databases, 226 DVDs and videos, 159 audio-cassettes and a good numbers of other resources of the library cover all branches of knowledge. In addition to these collections, the library subscribes print issues of 46 foreign and 19 local journals, 18 foreign and 22 local magazines, two foreign dailies and almost all leading national dailies of Bangladesh.

## **2.2 Developing Digital Resources Collection**

The NSU Library started subscription to e-resource databases, namely, Economic Literature (EconLit), Asian Health, Environmental and Allied Databases (AHEAD) and Global Development Finance in 1998. Before going to subscribe online journals in 2002, it was using open access online journals of IngentaConnect (aggregator), Oxford University Press, Cambridge University Press, Elsevier Science, American Society of Agronomy etc. which were hosted on publishers and aggregator's website for promotion of their online journals. After that, for the first time in the country, the NSU library started subscription to online journals in 2002 and MyAthens in 2005. It has subscribed JSTOR, IEEE, ACM Digital library and 39 titles of online journals including Oxford Economic Papers, Cambridge Journal of Economics, eight titles of Elsevier Science, etc. in various disciplines in 2002, although Chowdhury, M. H. H. and Khan, M. S. I. (2012) did not mention it in their article "Libraries and Librarianship in Bangladesh. In R. N. Sharma (Ed.), *Libraries in the early 21<sup>st</sup> century: an international perspective* (vol.2, pp.101-128). Munich: De Gruyter Saur". Currently, the library has access to full-text online research journals and books in various disciplines of 52 aggregators and publishers. Out of 52 publishers' databases, 37 databases subscribe through Bangladesh INASP-PERi (International Network for the Availability of Scientific Publications - Program for the Enhancement of Research Information) Consortium (BIPC), 6 databases subscribe through UGC (University Grants Commission of Bangladesh) Digital Library (UDL) consortium and rest of them access by individual institutional subscription, free license agreement or exchange programs.

## **3 Developing Repositories**

The NSU library formally launched its full-text journals and books repositories in 2003 by using NSU-LMS. These two repositories cover books, conference papers and journals articles written by teachers, students and researchers of NSU and articles of 160 online subscribed journals from 2002 to date. The numbers of articles and books of these repositories are over 21,500 and around 2000 respectively and it's increasing day by day. Later the library started digitization of its theses, reports and news-clippings on NSU by using the same software. All registered members of NSU library get access to all these digital repositories by using individual username and password from inside and outside campus through Internet. It should be mentioned here that the NSU library never used open source software, e.g. DSapce, GreenStone, Koha etc. for automation and digitization of its resources, although Chowdhury, M H. H., Uddin, M. N., Afroz, H. and Sameni, A. H. (2011) wrote in their article "Building institutional repositories in Bangladesh using DSpace: a new paradigm of

scholarly communication, *Library Philosophy and Practice*, <http://unllib.unl.edu/LPP/>)“ that the NSU library is using DSpace for Institutional Repository (IR).

### ***3.1 Motivations of the Library for the DRM***

Be and better demands of the patrons and global trends in digitization and digital resources, the NSU library encouraged to approach online digital resources to the university commune and subscribed online journals in 2002 and also implemented digitization its own resources in 2003.

### ***3.2 Work Forces during the establishment of digital resources***

Certain IT expertise Library personnel headed by the university librarian took responsibility to develop library management system along with a group of IT skills students of NSU led by a teacher of the Department of Computer Science and Engineering (CSE) developed NSU-LMS. These two teams time to time discussed, modified, updated, upgraded various modules of the library management system, tested and reviewed functionality before final launching. The titles of the journals and databases were selected on the ground of requirement of teachers and students of the university. Digitization of its own resources is opted to the library authority with the approval of the library committee.

### ***3.3 Motivation of the Top Management***

The NSU library proposed to subscribe online journals in lieu of subscribing print copy in the Library committee meeting in April 2002. As the committee members had earlier experiences to use online journals, therefore the committee agreed to subscribe online journals of various disciplines for the year 2002.

### ***3.4 Motivation of the Library Staffs***

The library staffs were encouraged to develop digital resources as they were aware of diversity in librarianship. Their participation in different training programs, seminars, workshops and visiting libraries in abroad also helped in this regard.

### ***3.5 Training for the Library Staffs***

In the journey of automation & digitalization, NSU library staff participated in different trainings and visit modern libraries in abroad including UK, USA, Japan, Singapore, China, Malaysia and India. The library also arranged a daylong workshop on “Role of Online Resources in Higher Education and Research” on March 4, 2004. In addition to these, the NSU library has been offering 14 week-long training Course in Digital and Online Librarianship since Fall 2004.

### ***3.6 Selection process of the software***

When the NSU library started subscription to online digital resources and launched library website in 2002, there was proprietary software available in the market but none of them was smoothly functional in Bangladesh. Open Sources Library Management Software was not in the field of library till then. On the other hand, the cost of foreign software was very high so the library authority decided to develop a new customized software. As the NSU library has been using a customized library automation software since 1996 so the library authority decided to upgrade existing software which was developed in Foxpro and Visual Basic.6 platform. At that time, a student of business school took a project work in his MIS course on Library Management Software and talked to the librarian about his software development. After his course work the student upgraded his software with the help of the Librarian and his team along with a teacher of the department of CSE and a group of his students. They worked together to develop web based NSU-LMS and a new library website on the platform of PHP and MySQL. This upgraded web based NSU-LMS along with full-text digital repository and new library website were finally inaugurated by then Minister for Commerce, Govt. of the People’s Republic of Bangladesh in June 2003.

### 3.7 Obstacle and Solution

On the journey to automation and digitization, number of obstacles came across. Main obstacle was knowledge gap between Library personnel and IT experts. So, we have to provide our requirements in written text, diagram, sometimes in layout, long discussion and sitting in front of computer to overcome this barrier. Another issue was the selection of software platform. Long debate was done for selecting platform whether the library use Oracle or MySQL, finally the library selected MySQL and PHP. In the beginning, the software was not properly supporting Bengali fonts but this obstacle has been overcome after incorporating Unicode/Utf-8 Bengali fonts.

### 3.8 Fund collection

The Library personnel, teacher and students of the NSU developed the NSU-LMS. There was no financial involvement but the students got remuneration as per student worker policy of the university. However, the existing new look of software and website is developed by Higher Education Quality Enhancement Project (HEQEP) fund.

### 3.9 Users training

The library arranges orientation program in the beginning of each semester for newly admitted students to make them familiar with system, services and facilities. Additionally, the library arranges introduction classes for the teachers and students of the various departments to make them familiar with digital and online resources of the library.

## 4. North South University Library Management System

North South University - Library Management System (NSU-LMS) is a customized integrated system developed by a group of students of the Department of CSE, NSU with the cooperation of library personnel. It is a web based system, developed in PHP and MySQL platform, where all library operations and activities were incorporated in two interfaces, namely, (1) Admin and (2) Web.

### 4.1 Admin Interface

The admin interface is designed for acquisition and processing, circulation, membership, record-keeping and management, digitization, networking, library administration and policy making. This Interface further divided into three modules like, (i) Acquisition and Processing (ii) Circulation, and (iii) Member's.

CIRCULATION MODULE			
Book Circulation	Journal Circulation	Magazine Circulation	
Audio Visual Circulation	Auto Email Alert	Regulate Reservations	
News & Events	Clear Fine		
ACQUISITION AND PROCESSING MODULE			
Add New Book e-Book	Add New Audio Visual	Generate Barcode	
Add New eJournal	Add New eThesis		
Add New Print Journal	Add eNews-Clipping	Clear Archives	
Add New Print Magazine	Check Accession	Backup System	
Add New Print Newspaper	Change Accession	Download Book Data	
MEMBER'S MODULE			
Add New Member	Modify Member	Set Member Privilege	Set IP Permission
Add Admin Member	Modify Admin Member	Manage Departments	Member Suspension
Member Facility/Code	Check Member Status	Recorded Activities	Member Validity
Online Application	Delete Member	View Drop-Box Msg	

Fig. 1: Admin Interface

### 4.1.1 Acquisition and Processing Module

This module is consisted of data entry of books, A-V materials, journals, magazines, newspapers and theses, uploading full-text contents and images, barcode generation, backup system, clear archives and downloads book data options.

The data entry work-sheet is formed according to AACR-2 for bibliographic data along with uploading *pdf* file and image. Some more entry lines have been included in the sheet to meet the requirements of the automation and digitization of the library resources and it is compatible with MARC21 format.

**Book Entry:** The book data entry work-sheet is arranged with the items- Accession Number, Authors, Editors, Translators, Compilers, Foreword By, Introduction By, Illustrated By, Title & Sub Title, Translated Title, Edition, Volume, Part, Vol. Title & Part Title, CD / DVD Accession, Place of Publication, Publisher, Year, Collation, Index, Bibliography, ISBN, Series, Series Editor, Call Number, Category (book, report, CD/DVD etc.), Bill Code, Date Received, Date Ordered, Price, Converted Price, Source, Confined, Location, Quantity, Description, and Keywords . There is an option to upload cover page, *pdf* file and image.

The screenshot displays a web-based form for MARC21 data import. At the top, there is a section for 'MARC21 Data' with a 'Browse' button and a 'Load Data' button. Below this, the form is organized into several sections: 'Title' and 'Sub-Title' fields; a large 'Personal Names (245-5c)' field; a grid of fields for 'Author1', 'Author2', 'Author3', 'Editor1', 'Editor2', 'Editor3', 'Corporate Author', 'Translator', 'Compiler', 'Foreword By', and 'Introduction By', 'Illustrated By'; and a final grid of fields for 'Edition', 'Volume', 'Part', 'Place of Pub.', 'Publisher', 'Year of Pub.', 'Collation', 'ISBN', 'Series', and 'Call Number'.

**Fig. 2: MARC21 data import interface**

**Journal:** The journal or e-journal data entry work-sheet is consisted of- Journal Title, ISSN, Frequency, Subscription Rate, Publisher, Source, Issue, Volume, and Day/ Month/Year with an option to upload *pdf* file.

**Magazine/Newspaper:** For Printed Magazine/Newspaper/News-Clipping, the data entry work-sheet is consisted of- Title, Frequency, Issue, Volume, Day/ Month/Year along with option to upload *pdf* file.

**Thesis:** For Thesis Paper entry sheet is arranged with- Thesis Title, Author ID (NSU ID), Author Name, Supervisor, Institute, Department, Degree name, Total Page, Place of publication, Year and Keywords along with uploading *pdf* file.

**Audio-Visual:** The data entry work-sheet of a-v materials is arranged with – Accession, Title, Subtitle, Author, Editor, Translator, Producer, Director, Publisher / Distributor, Place, Year, CD with Book, Call No, Medium (CD/VDV/Audio Cassette, etc.), Runtime, Subject, Quantity, Bill Code, Date Received, Date Ordered, Price, Converted Price, Source, ISBN, Description and Keywords.

There is option to download book data in a text file for transferring to DLA (Digital Library Assistance), a small electronic device of RFID system is used to searching and sorting books on shelf according to call number. It also generates library membership and book bar-code, facilitated manual data backup (although the system maintain auto data backup in every hour) and clear archives.

### 4.1.2 Circulation Module

This module is consisted of circulation (loan and return), reservation management, clear fine, auto-email alert and news and events of the library.

All types of library resources can be issued and returned to the individual user through the circulation option, upload news and events of the library, and auto-email alert services to the registered users for over-due items of the library. There is an option to manage online reserved books and clear overdue fine of the library members.

#### *Circulation of Book/Audio-Visual/Journal/Magazine:*

Admin user input library user's id number and accession number of the resources for circulation. Member can also use *RFID Self-Check Machine* to issue or return library resources by themselves.

*Fine Clearance:* If student fails to return borrowed books on due date, fine is calculated by the system. Without returning book and clearing fine he/she is not allowed for further library transaction. Moreover, next semester registration is also kept holding on. In this case, student must clear his fine by bank payment and also from library system clearance.

Accession	Title	Due Date	Issue Date
1232	Halliwells filmgoers companion	2015-08-23	2015-08-20

**Fig. 3: circulation interface**

*Regulate Reservation:* Admin user can cancel any reservation if needed.

*Auto email Alert:* Auto email is sent by the system itself to the library members for reminding their borrowed over-due items.

*News and Events:* News with photographs of any event of the library can upload on the library website through this function.

### 4.1.3 Member's Module

This module is designed to manage library members and their facilities. Its consisted of Membership Application, Admin Member, Modify membership, Check member status, Delete member, Member suspension, Member validity, View Recorded Activities, Member's facilities, Member's privileges, Manage departments, IP set permission and View drop-Box Messages.

*Membership:* Interested faculty members, students and officers of the university apply through online membership application form to the library. The admin user of library verify the application and approve online if find all information are correct. After the approval, the member's information automatically saved in the membership database. Then the applicant gets an individual library membership number and password by email. If the application is incomplete, an email is sent to the applicant for correction.

Select	NSU ID	Name	Status	Dept.	Date Applied
<input type="checkbox"/>	1520806643	Shiprat Islam Chowdhury	Undergraduate Student	EEE	2015-08-09 10:48:44

**Fig. 4: Online membership approval (part one)**

Last Member Entry: Shah Afsarul Islam - GT151019770

Registration Page			
First Name :	Shiprat	Last Name:	Chowdhury
Middle Name :	Islam	Gender :	Male <input checked="" type="radio"/> Female <input type="radio"/>
NSU ID :	1520806643	Previous NSU ID :	
Library Membership No :	ST	Designation :	
Department:	EEE	Email Address:	shipratislam@gmail.com
Phone:	01534944067	Status:	Undergraduate Student
Pasword:	Sp1ty	Confirm Password:	****
Address:			
House #58, Road #4 Plot #Block D, Bashundara R/a P.S:Bhatara Police Station, Dhaka			
Photograph:		Choose File No file chosen	
<input type="button" value="Approve"/>		<input type="button" value="Reject"/> <ul style="list-style-type: none"> <li><input type="checkbox"/> Incorrect Photograph</li> <li><input type="checkbox"/> Incomplete Information</li> </ul>	
<input type="button" value="Exit Page"/>			

**Fig. 5: Online membership approval (part two)**

*Admin Member:* Super Admin creates Admin member and set privileges for individual admin member according to his/her nature of job in the library. Every admin member gets individual user name and password. The super admin set admin privileges from this table.

Level	Add User	Modify User	Add Book	Modify Book	Calculate Fees	Regulate Reserves	Return Books	Loan Books	Clear Fines	Add Staff	Modify Staff	Modify User Rates
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Fig. 6: Admin member privilege interface**

Super admin can modify admin member's information and admin user can also modify user's information, check member status, delete member, member suspension, member validity, if this privilege is given by super admin.

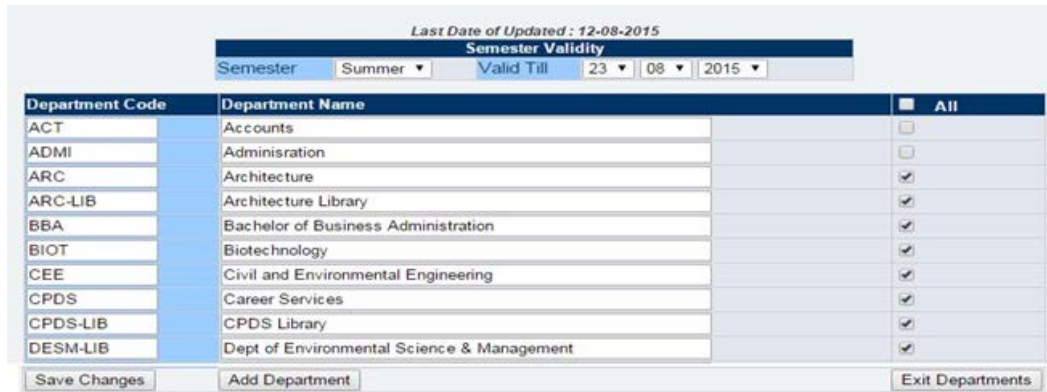
User Code	Day Limit on Books	Loan Limit on Books	Day Limit on Multimedia	Loan Limit on Multimedia
ST	14	2	14	2
CF	90	15	14	10
SF	14	3	14	3
VF	90	15	14	10
PT	90	5	14	5
GT	14	3	14	2

**Fig. 7: Library members' facilities setup**

Super admin can modify admin member's information and admin user can also modify user's information, check member status, delete member, member suspension, member validity, if this privilege is given by super admin.

*Members' Facilities:* Admin user can assign members' facilities according to policy of the library, like number of borrowed resources, duration of loan, overdue fine rate etc.

*Manage Departments:* Admin user can fix the duration of validity of membership according to policy and their affiliated departments.



**Fig. 8: Manage departments**

*View Recorded Activities:* Admin user can view statistics and different activities of the library as per their need.



**Fig. 9: View activities and statistics**

## 4.2 Web Interface

Nowadays, Library website is an effective interface which is designed in such a way that it can build relationship between users and library resources. All facilities and services are laid on the website for easily accessible to resources and maximum utilization of services. The NSU library website homepage is presented in different groups of facilities and services, namely, About Library, Library Catalogue Search, Online Services, Repositories, Print Archives and Remote Access. The first group describes general information about the library, its policies, user guide etc.

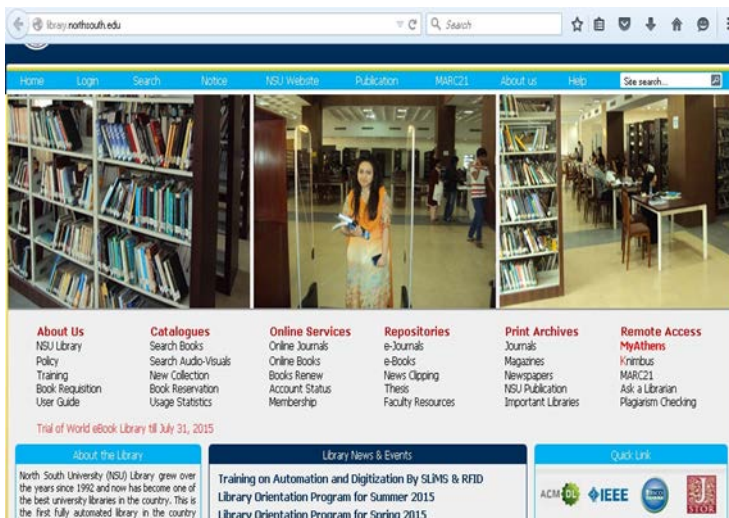


Fig. 10: Home page

*Catalogue Search:* The library system provide Keywords (basic) and Guided (advanced) search facilities through online for all, the library member can reserve three books at a time for 48 hours.

Everyone can view the availability of the resources, its location in the library and if it is issued than date of returning the resources. User can write comment on book and view the rate of use of book.

Cover Page	Book Title	Author(s) / Editor(s)	Edition	Year	Availability	Location
	Car parking : what works where			2006	Available	Architecture Library
	Chemistry for environmental engineering	Clair N. Sawyer, Perry L. McCarty, Gene F. Parkin	4th	1994	Available	Central Library
	Chemistry for environmental engineering and science	Clair N. Sawyer, Perry L. McCarty, Gene F. Parkin	5th	2003	Available	Central Library
	Christiansens electronics problem-solving companion	Victor F.C. Veley, Jacqueline S. Parkinson		2001	Available	Central Library
	Economics	Michael Parkin	11th	2014	2015-07-27	Central Library

Fig. 11: Search Result (part one)

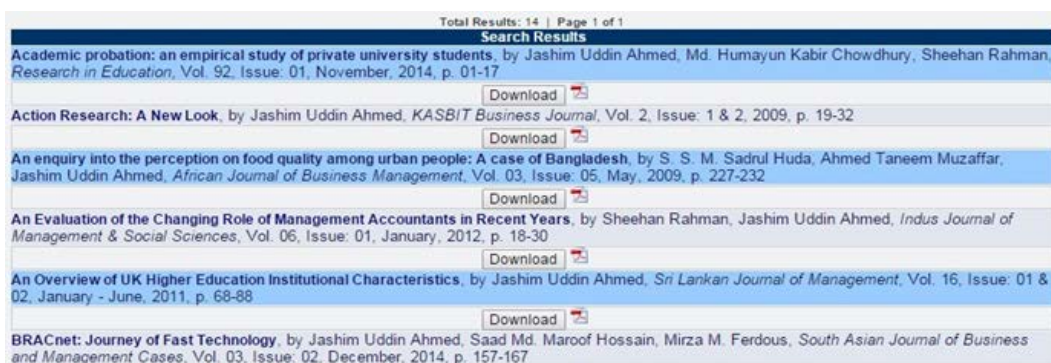
Accession	Volume	Part	Edition	Year	Location	Availability	Loaned To	CD Accession	Reserve
37752			11th	2014	LIB	Available			
37763			11th	2014	LIB	2015-08-14	CF06306759		
38438			11th	2014	LIB	2015-08-23	CF143018196		

Fig. 12: Search Result (part two)

Admin member can view the details about the member who issued the book and can call it back if needed. The member can view the usage status of the resources and the latest added 100 books and other resources on the website

*Online Services:* The library member can reissue/renew the borrowed books, check their borrowing status and they can place their query and demand to the library personnel through online.

*Repositories:* The library maintains full-text repositories of e-journal, e-book since 2003 and e-thesis, e-news-clipping since 2014. All registered users can navigate these repositories and read, download full-text articles, books, theses by using membership number and password.



**Fig. 13: Repository search result**

*Print Archives:* NSU-LMS maintain databases of print journal, magazine and newspaper. The bibliographic data of all databases of print materials are searchable through internet.

Anannya		
<b>Year: 2015</b>		
Volume: 27,	Issue: 11,	April - 2015
Volume: 27,	Issue: 06,	January - 2015
Volume: 27,	Issue: 08,	February - 2015
Volume: 27,	Issue: 10,	March - 2015
Volume: 27,	Issue: 05,	January - 2015
Volume: 27,	Issue: 07,	February - 2015
Volume: 27,	Issue: 09,	March - 2015
<b>Year: 2014</b>		
Volume: 26,	Issue: 09,	March - 2014
Volume: 27,	Issue: 04,	December - 2014
Volume: ,	Issue: Eld,	July - 2014

**Fig. 14: Print archive search result**

*Remote Access:* My Athens has been giving the privilege for remote access to the subscribed online books and journals since 2005, but for having access to full-text digital repositories of NSU, individual library membership number and password is required.

## 5 Future Plan

The library will expend web-based library services to meet the demands of the users. It will also set up an Institutional Research Repository, Virtual Private Network (VPN) and join to more national and international consortium and collaborative networks.

## 6 Conclusion

When none of the library management software was functioning well in Bangladesh then the NSU library developed a customized integrated library management system, i.e. NSU-LMS by the students and library personnel of the university. All standard modules of automation and digitization were in this system. The system management team always kept it up to date as per requirements of the users. This is only customized integrated library management system in Bangladesh which has been functioning without any difficulties in last one and a half decade.

Before going to customize any system, it is necessary for library personnel to make clear about requirements and future plan of action of the organization. Short term and long term goals must be determined and present it clearly before the system management team. If the library personnel do not have enough expertise in that case may look for help from experts. Our experience says that IT expert along with IT librarians are necessary for identifying problems, determining requirements and best fit them with the system. This is the era of open source

and open access so it is very common opening up new Free Open Source System (FOSS) in the field of library management. The library professionals must be prepared themselves to customize FOSS in their respective library to meet the goals of the organization. FOSS makes the library manager's job easier as compare to before. Where the NSU library developed customized system NSU-LMS with hardworking in one year but now customization of any open source ILS may take a few days. Good thing does not come easy but good FOSS makes the library management fast and easy.

# Steps towards Digital Bangladesh: Bangladesh Bank Library (BBL) perspectives

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**Abstract:** ICT has tremendous effect in today's world ranging from the cradle to the funeral dirge, from the birth registration through education, health sector and employment to ultimately death registration, from public information to customized one. It has changed the way we live, learn and disseminate. Digital Resources Management (DRM) in libraries is going through paradigm shift and has a strong correlation with building 'Digital Bangladesh'. In this connection, this paper tries to endorse the activities initiated by Bangladesh Bank (BB) as well as Bangladesh Bank Library (BBL) in attaining the dream 'Vision 2021: Digital Bangladesh'. How BBL has managed its digital resources and substantially contributed in the realization of the stated dream is discussed elaborately. A holistic approach has been taken and interview method has been followed to collect the information on the previous state of the library and how the library has been moving gradually towards the DRM.

**Keywords:** Vision 2021, Digital Bangladesh, Digital Resources Management, DRM, Bangladesh Bank, Bangladesh Bank Library, Digital Library, Library Modernization

## 1. Introduction

Our economy is continuously being reshaped by the forces of globalization and technology. The impact of information and communication technology (ICT) is giving rise to a new type of economy - the knowledge based economy. It has also been found that technology has had a crucial role in defining today's globalized market structure (Alam, 2009). Realizing the scenario, present government of Bangladesh intended to build up Bangladesh as a digital one by 2021. Alongside this, the national ICT Policy 2009 has also expressed its vision in terms of the expansion of ICT and its multifarious application to establish a transparent, committed and accountable government, to ensure the development of skilled manpower, to improve social justice, to ensure public services through private-public partnership and to offer its assistance to the raising of the country to the status of a middle income country by 2021. Since, the IT revolution has intensified the move towards knowledge codification, and increased the share of codified knowledge in the knowledge stock of advanced economies, all knowledge that can be codified and reduced to information can now be transmitted around the world at relatively little cost. Thus ICT is referred to as the vehicle of knowledge Economy (General Economics Division, Planning Commission, Government of The People's Republic of Bangladesh, 2010)

Since then, all the government, semi-government and private organizations are trying to perform their activities digitally in consistent with Vision 2021. Bangladesh Bank (BB) also started initiatives to transform the activities of banking sector with the help of ICT. It has also been observed that libraries and information institutions has picked up the ideas of being 'Digital' in the recent period, resulting in contributing substantially in the process of making the dream of 'Digital Bangladesh' realized. Bangladesh Bank Library (BBL) has also taken initiatives to serve the user-community with the digital resources at their desk. In effect, the intention of BBL is to contribute in establishing GREEN banking in terms of knowledge management. Steps towards 'Digital Bangladesh' taken by Bangladesh Bank as well as by Bangladesh Bank Library are discussed later.

## ***1.1 Background and Meaning of Digital Bangladesh***

With appropriate policies, supplemented by realistic strategies, ICTs are known to have brought tremendous welfare to people in terms of better access to information, job creation, and enhanced public services through efficient governance and diversification of economic opportunities. Countries are using ICTs to participate in the international economy, to exploit emerging technologies for the betterment of their citizens, to modernize institutions and markets (Access to Information [A2i] Programme, Prime Minister's Office [PMO], 2009). Digital Bangladesh means digitalizing Bangladesh by ensuring an ICT based society where information will be available on line. The motto of digital Bangladesh is to establish technology based digital governance, e-commerce, e-agriculture, e-production, e-education etc. It will make people think globally and connect them with the whole world economically, socially, politically, academically and even culturally.

## ***1.2 Background of the Bangladesh Bank (BB)***

Bangladesh Bank, the central bank and apex regulatory body for the country's monetary and financial system, was established in Dhaka through Bangladesh Bank Order, 1972 (P.O. No. 127 of 1972) with effect from 16th December, 1971. At present it has ten offices located at Motijheel, Sadarghat, Chittagong, Khulna, Bogra, Rajshahi, Sylhet, Barisal, Rangpur and Mymensingh in Bangladesh with a total manpower stood at 5807 (officials 3981, subordinate staff 1826) as on March 31, 2015 (Establishment, About us., 2015).

## ***1.3 Digital Bangladesh: Bangladesh Bank and Bangladesh Bank Library (BBL)***

As the regulatory body of the banking and financial sector, Bangladesh Bank adopts policy and strategy that would ultimately facilitate building Digital Bangladesh in respect of financial sector. To justify, Rahman, A. (2013) indicated that in order for economic growth momentum to pick up, and to be more broad-based, inclusive and participatory, gender-sensitive, and sustainable in the era of information technology and knowledge economy, Bangladesh Bank has undertaken steps to modernize its credit information bureau to CIB Online, installed automated clearing house (ACH), initiated developing BB's own Enterprise Resource Planning (ERP) software. Mentioning some of the giant stride that Bangladesh Bank had made towards Digital Bangladesh like allowing online money transactions, payment of utility bills through the Internet, facilitate online credit card payments in local currency, Rahman, A. (2013) iterated that a country like Bangladesh goes digital means it will be an e-state combined with e-governance, e-banking and e-commerce, e-learning, e-agriculture, e-health and so on.

Besides, mobile phone based remittance service, mobile banking, Consumer Interest Protection Centre with hotline 16236, Magnetic Ink Character Recognition (MICR) in cheque, Bangladesh Electronic Fund Transfer Network (BEFTN), National Payment Switch, Bangladesh (NPS,B) and so on are some of initiatives that were adopted and implemented by Bangladesh Bank in the recent period (Rahman, A. 2013). Moreover, connecting head office and other branch offices through LAN/WAN, e-Tendering, e-Recruitment, Open Data Initiative for downloading various publications free of cost, Prize Bond Matching, Shanchay Patra System, e-Noting, Enterprise Data Warehouse (EDW), are also commendable initiatives taken by Bangladesh Bank to make it a digital office (Bangladesh Bank, Department of Printing and Publications, 2012) and (Bangladesh Bank, Department of Communications and Publications, 2013).

As a child unit of Bangladesh Bank, Bangladesh Bank Library also contribute in building Digital Bangladesh. Its initiatives include in-house built e-Library and e-News Clipping software. e-Library software provides access to library catalogue, book reservation, book requisition as well as to e-Books and e-Journals, whereas e-News Clipping software provides news clipping service from more than 35 sources (newspaper and online news sources) on banking, finance and economic related issues. For Audio-Visual collection, 'SLiMS' is being used whereas, for Archival resources management, a proprietary software is under the process of procurement. For instant un-accessioned item's circulation, another software 'Newspaper Circulation System' is being used. Moreover, 'Bangladesh Bank Intranet Portal' itself is kind of a digital archive wherein all the information such as departments and offices information, employee information, e-Attendance, office/ staff order, phone directory, notice board, rules and regulations, circular, publication, speeches, etc. are uploaded by the concerned department and through Applications Links, a user can take necessary support and utilize these resources.

## ***1.4 Introduction of the Library, Library Resources and Services***

Started its journey in 1962 as 'State Bank of Pakistan Library', 'Bangladesh Bank Library (BBL)', with a total space of 17,907.23 sqft, is one of the highly resourceful specialized libraries in the country with rich collection of books, journals and periodicals. The Library Committee is headed by the Deputy Governor along with Executive Directors and Economic Advisor as members. As of professional chief, General Manager of the library takes care of all operational and administrative affairs of the library (Bangladesh Bank Library, Departments and Offices, About us, 2015). Presently, the Library has mainly two functional divisions with the following sections:

- 1 Library Division**
  - i Library Section
  - ii Institutional Repository (IR) /Archive Section
- 2 Documentation Division**
  - i Documentation Section
  - ii Audio-Visual, Language and Cyber (AVLC) Section

### ***1.4.1 Library resources***

Library resources include books, journals, magazines, audio-visual materials etc. on banking, finance, economics, economic development, etc. Besides these, research papers, reports and publications of different national and international organizations especially central bank of different countries, World Bank, IMF, ADB, IDB, UN, and WTO are also available. Resources also cover more than 35 national and international newspapers and 2 international websites.

***Table 1: Library Resources at a Glance***

Books	35,171 book titles, 700 e-books
Periodicals / Journals	22,000 bound periodicals (journals / magazines)
Online Subscription	30,000 title e-journals and e-books through INASP-PERI and online news portal
Institutional Repository (IR)/ Archive Collection	BB Publications, Rules, Regulations, Policy, Guidelines, Internship and Thesis Report, Research Articles, Policy Notes, Working Papers, Training Materials, etc.
Audio-visual & Language Collection	1500 CD/ DVD/ softcopy 200 Books on different languages including practice materials on IELTS, TOFEL, GRE, GMAT etc.
News Clipping	News Paper and News Clipping: Since 1962 - Present Date News Clipping Subject: 41 Broad heading Online News Clipping: More than 57,000

### ***1.4.2 Library Service***

Bangladesh Bank Library (BBL) currently renders following services but are not limited to:

- ❖ Reading Room and Circulation Service
- ❖ Reservation Service
- ❖ Overdue Notification and User-end re-issue Service
- ❖ Reference and Reprography Service
- ❖ Documentation (Periodical) Service
- ❖ Institutional Repository/ Archive Service
- ❖ Audio-Visual, Language & Cyber Service
- ❖ e-News Clipping Service
- ❖ e-Resources Service
- ❖ Access to branch libraries through Intranet Portal
- ❖ e-Library service for people all over the world through web portal
- ❖ Online Current Awareness Service
- ❖ Publication Exchange with National & International Organizations

## **2. Digital Resources Management (DRM) Background in BBL**

Previously, BBL provided only the bibliographic information search service for book only, but realizing the digitization phenomenon and urge for ubiquitous technology interventions, BBL moved to journals, e-Resources like e-Books, e-Journals (from INASP-PERI), e-News clippings, audio-visual clips and the like. Besides these, BBL subscribes [www.centralbanking.com](http://www.centralbanking.com). Empowering employees of Bangladesh Bank to search library catalogue and use resources sitting at their desk was the focal motivation for going to what we call 'Digital'. Before moving to central-server-based in-house built software 'e-Library' and 'e-News Clipping' to secure all the data, BBL used Local PC-based 'Library Management System' for circulation and is available in circulation counter only.

### ***2.1 Motivations of the Library for the DRM***

Recognizing the importance of digital resources, Gupta, R.C. (2000) indicated that existing information carriers on paper or celluloid (books, journals, microforms, tapes, optical devices, etc. and their surrogates like secondary or tertiary documents) are being converted into computer readable databases gradually to meet the present need of the society. To make the library of international standard and up-to-the-mark, BBL started initiating the process of e-resources management. In effect, it is benefits of digital collection that work as the driving force to move to DRM. Moreover, the benefits can be supplemented by the findings stated in the paper by Javed I. Khan (Khan 2006). He identified 8 strategic benefits those can be acquired immediately. The below are mentioned some of the advantages of the digital resources management that influence us to dive into world of digital collection:

1. Space management as digital resources requires very little space as compared to physical collection
2. Round the clock availability and real-time access to resources facilitating just-in-time learning disregarding the library operating hours
3. Cost minimization as no/ little cost associated with the building, maintenance of the facilities and utilities, and most importantly employing human hours
4. Accessible by the disabled and information can be updated in less time
5. No physical boundaries making it possible to access the collection from anywhere
6. Supporting different learning styles and formats
7. Information retrieval through user-friendly interfaces searching the entire collection
8. Promoting networking capabilities facilitating seamlessly integrated resources sharing
9. Direct users to relevant resources providing several access points
10. Multiple accesses facilitating a number of users accessing the same resources
11. Structured approach making it possible to move from the catalogue to the particular book then to a particular chapter and so on
12. Preservation and conservation helping us creating multiple copies of the same resource without degradation in quality

### ***2.2 Work Forces (Selection of the People and their Responsibility) during the establishment of the DRM***

Bangladesh Bank developed a couple of software for Digital Resources Management (DRM) namely 'e-Library' and 'e-News Clipping' with the help of ITOCD (IT Department of BB) taking the requirement from the library, though library needed to maintain liaison time to time with the ITOCD to foster the development of the project. Ultimately, the software came into being in 2012 and then onwards, the software 'e-Library' and 'e-News Clipping' is maintained by library, whereas the super-admin authorization still vested in the ITOCD. For Audio Visual materials, an open-source software 'SLiMS' is being used creating a local server, of which super-admin authorization is vested in Library. For Archival resources, an Enterprise Archival Solution is under the process of procurement.

### ***2.3 How the Library Management Motivated the Top Management***

The top management, mainly Governor and the Deputy Governor under whom the ITOCD operated were made aware of the current development in the field of library and information technology. They were made informed that the library operation can be automated; the then-used local-PC based system can be converted into the server-based system. It was also highlighted that when the system comes in operation, all the employees of Bangladesh Bank would get the library services sitting at their own desk. Being motivated, they suggested making a proposal and after approval, a request was sent to ITOCD to prepare software as per requirement.

## ***2.4 How the Library Management Motivated the Library Staffs***

Previously, library personnel needed to take backup for the library system from the local-PC based software which was really time-consuming and tiresome, moreover, a person was required to stick to the counter as the system was available there only. To avoid these, library staffs feel motivated to go for a newly intranet-based solution. Moreover, library personnel have previous work experience with the Digital Resources that also motivated them to get the project done.

## ***2.5 What kinds of Trainings were arranged for the Staffs***

BBL itself has not arranged any training programme for the library staffs yet, however it nominates 2/3 of the library staffs to almost all the training programmes organized by different library association and organizations. Besides, BB approves different study visits to different central bank libraries around the world for its library staffs. Moreover, as the library personnel had previous work experience with the basic features of the LMS, they adopted the workflow of system by virtue of dealing with it.

## ***2.6 Software Used, and the Selection Process of the Software***

Since, every different organization has different kind of needs and requirements, Bangladesh Bank Library as a special library is using several software for different purposes. In this regard, ITOCD realized that library software needs to be integrated with several other software already integrated and used by Bangladesh Bank, they decided to go for custom-made software. They are as follows:

### ***2.6.1 e-Library Software***

Integration with different banking and ERP software made library decide to develop its own e-Library software with the help of the ITOCD (Information Technology and Operation and Communication Department) of Bangladesh Bank. 'e-Library' has been used for circulation, reservation, cataloguing as well as e-resources (e-Books, e-Journals, e-Magazines and the like) management.

### ***2.6.2 e-News Clipping Software***

Replacing the manual news clippings system, the library decided to make the news clipping services reach the desk of the employee. Taking the help from the ITOCD, the library has come up with software named 'e-News Clipping'. Since then, all the clippings are made digitally (.pdf) collecting news from more than 35 newspapers and 2 international websites on daily and weekend basis and made those archived as well.

### ***2.6.3 SLiMS***

In 'Audio-Visual, Language and Cyber Section' of the library, audio, video, documentaries and photographs of different programmes of Bangladesh Bank are preserved. To provide access to these resources from the employee desk, the library is using SLiMS (Senayan Library Management System), an open source software, creating a local server.

### ***2.6.4 Digital Archiving Solution***

Bangladesh Bank has intended to archive each and every significant documents through an online archiving solution. Since, a number of security system and integration with different software like ERP is needed, a customized-built proprietary software is going to be procured.

Moreover, since Bangladesh Bank (BB) has a number of software integrated including ERP, BB has created kind of a repository from 2012 in the name of 'Bangladesh Bank Intranet Portal' under the ERP Software, wherein all office order, circular, employee information, publication, speeches, etc. is published and stored.

## **3. Practical Problems Faced and how it Overcome**

Idea generation was the main problem that BBL faced in the primary stages of developing the software. Besides, not being involved from the very beginning with the design process while designing the basic structure of the software was another drawback. Moreover, as the scenario prevails in Bangladesh, the designer rarely takes feedback from the people for whom the software is meant. It was observed that either ITOCD was not being able to understand library's requirement or they are not satisfied with what the library was proposing for the

design of the software. To the contrary, ITOCD was suggesting to develop the software another way that the library personnel was not satisfied with. Thus, the development results in costing huge time and went through changes over and over. This problem was mitigated by being persistently involved in the design process in later stages of software development. Convincing ITOCD through personal relation was another way to get the software off the ground.

### ***3.1 Fund Collection***

As the software 'e-Library' and 'e-News Clipping' was developed in-house using its own human resources and talents, no extra fund was needed except the amount fulfilling the hardware requirement, whereas the 'SLiMS' is an open source software.

### ***3.2 Measures Taken to Training Users***

Up to now, some training programmes has been arranged for the users of the library as a form of library orientation programme, where officials from different departments participated and learned how to make most-use of the library system. Moreover, a programme was also organized by BBTA (Bangladesh Bank Training Academy) at their premises where personnel from the library was the trainer.

### ***3.3 How the System Works***

#### ***3.3.1 Metadata Management***

e-Library: Dublin core metadata standard is followed in 'e-Library' software. The following bibliographic information is recorded in the cataloguing entry: accession number, call number, book title, sub-title, publish year, publisher, place of publication, author information, corporate author, editor, translator/ compiler, edition, translated title, volume/ part, ISBN, collation, series, keywords, notes, language and subjects. Besides these, check boxes and radio buttons for whether there is bibliography, CD/ DVD, index available with the resources as well as billing information such as order date, receive date, price, source and location are also recorded in the system.

e-News Clipping: The following metadata fields are incorporated in the system for describing the news items: title, news file location, URL of news source, published date, posting date, category, sub-category and keywords.

SLiMS: There have been specialized metadata fields incorporated with SLiMS such as statement of responsibility, specific detail information, GMD (General Material Designation) and so on in addition to the field found in common library management system.

#### ***3.3.2 Access***

e-Library: Resources can be accessed using one of the following access points: book title, subject, keyword, publisher, publish year, author and location. Moreover, facilitated browsing by 'subjects' as well as 'all publication in alphabetic order' is also available in the system.

e-News Clipping: e-News Clipping can be accessed using one of the following access points: title, keyword, source newspaper, sub category, publishing date, posting date.

SLiMS: Audio-visual files can be accessed by title, author, GMD, subjects, collection type, ISBN/ ISSN, location.

#### ***3.3.3 Administration***

Generally, the operational administration for 'e-Library' and 'e-News Clipping' software is administered by the library personnel, whereas the super-admin features are vested in ITOCD (IT department of Bangladesh Bank), whereas in case of 'SLiMS', operational and super-admin authorization both are vested in the Library.

### 3.3.4 Subscription

Currently, we are subscribing resources through INASP-PERI costing about 2500 USD, besides this, a news portal titled 'central banking.com' has also been subscribed costing 1500 GBP.

### 3.3.5 License

As the software 'e-Library' and 'e-News clipping' is created in-house, the copyright is with the Bangladesh Bank itself. Whereas, SLiMS is an Indonesia-based open source software.

### 3.3.6 Usage Statistics

It has been seen that everyday about 25 books, 12 journals/ periodicals, 15 AVLC materials, 2 IR materials and 3 newspaper has been checked-out by the users of the library

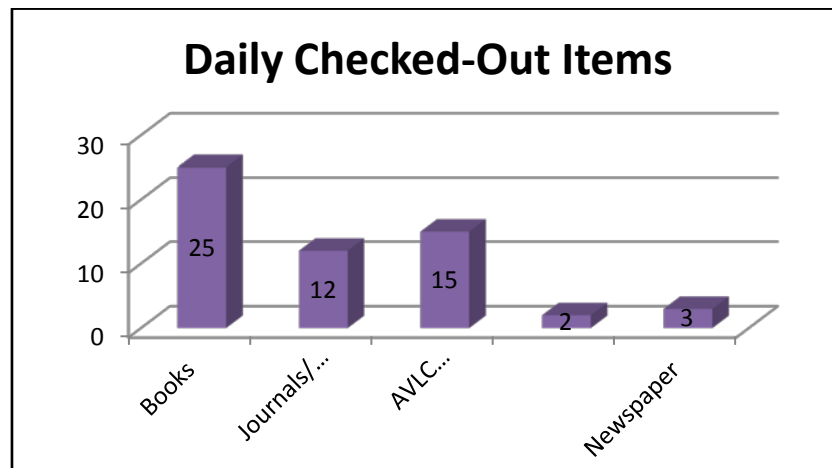


Figure 1: Checked-out items

It can be seen from the chart that on-average 40 users avail reading services, 20 users receives circulation services, 5 come to have photocopy and spiral, on the other hand 15 come for reference information.

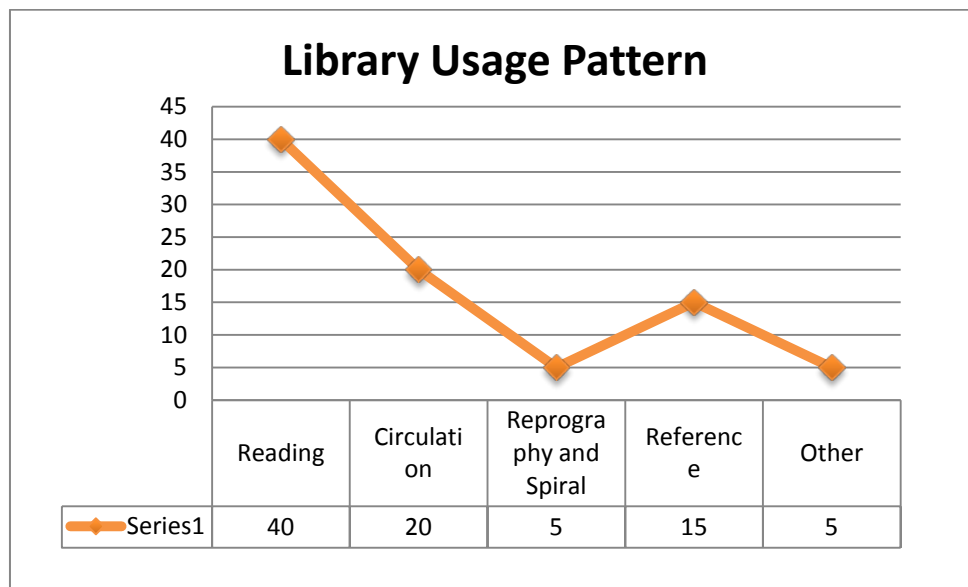


Figure 2: Library usage patterns

#### **4. Visible and Non-Visible Benefits Gained by the Library**

After implementing the software, there were tremendous changes in terms of library usage. A user can now enjoy the library facilities at their fingertips. They can avail the search and retrieve facilities for e-Books, e-Journals, e-Magazines, daily and weekend news clippings as well as audio-visual clips. In addition to this, a user-end reissue facility has also been tagged into the system through which a user can re-issue his/ her material. Besides, the Bangladesh Bank Library is enjoying most of the benefits those can be gained implementing digital resources management, to name a few, no issue-return, employing less work force and less human-hour and so forth.

#### **5. On-going Modernization Projects and Future Plan**

There are several projects going-on in the library, to name a few:

- ❖ Establishing a knowledge management centre thus creating a green library
- ❖ Building networks with libraries of banks and non-banks financial institutions, other special libraries and the like
- ❖ 'Bangladesh Bank Digital Archiving Committee' has been formed to foster the development of archiving project.
- ❖ Enterprise Digital archiving solution to be procured.
- ❖ 2 new sections namely 'e-Resources Management Section' and 'News Paper and News Clipping Section' is planned to be introduced
- ❖ e-Library services for people all over the world through World Wide Web
- ❖ Digital Information Delivery service through 5 signage and 5 kiosks
- ❖ Live Photo and Award Gallery by means of 5 signage
- ❖ Virtual Currency Museum and Projection of Documentaries
- ❖ RFID is going to be introduced in the next few months
- ❖ A video editing panel in under the process of establishment

In effect, the motto of Bangladesh Bank Library is to establish more use of softcopy that would results in reducing the use of hardcopy resources, thus contributing in making the planet greener.

#### **6. Lessons for Organizations that Like to Implement DRM System**

Alam, Md. Saiful (2012) in his paper identified fifteen challenges those need to be tackled while implementing the digitization project for the library. From BBL perspectives, attachment with IT people from the very beginning of the software development is needed as the software to be built in-house, whereas if thinking of using an open-source software, relevant IT knowledge would be required to make customizations to suit to library's needs. In fact, primarily it is the mentality to adapt to new system that needs to be internalized by the library management that can foster the initiation of the digitization project. Besides, IT knowledge (in library software) is also mandatory to negotiate with the vendors. Moreover, convincing the upper-level to make them realize the importance and tangible and intangible benefits of instituting digital resources management needs to be considered as well. It is highly recommend that before initiating the project, a proper funding as well as operational cost should be kept in mind. However, we should move to digital resources for several reasons though, some of the below-mentioned barriers should also be kept in mind:

1. Copyright issues relating to digital information as thought-content of one author can be easily duplicated and shared
2. Stable Internet connectivity thus limiting the user living in rural areas and belongs to poor population of the society
3. Skilled professionals to manage digital resources
4. Increased number of resources making user disoriented with the information overload
5. Less job opportunity as the digital resources can be managed employing less human resources
6. Digital libraries can be hacked - this involve a service disruption and it might infect the users' PC with viruses
7. Lack of standardization in terms of digital information
8. Multiple vendors with varied accessibility features like who can access what for how long
9. Various platforms needs to be addressed as users might access the resources using different devices like mobile phone, Tablet computer, etc.

10. Coping with rapid changes in technology, otherwise resources might become out-dated and inaccessible
11. Digital library cannot reproduce the environment of a traditional library as physical print resources are easy to read for human-eye than on computer's screen.
12. Initial cost is comparatively high
13. Equity of access thus creating digital divide
14. Interoperability between system and software
15. User authentication for access to collection as well as training and development is also considerable

## 7. Conclusion

Realizing the importance of transition from traditional libraries to digital libraries, Tomas Doherty (2014) apprehended that in recent years libraries have been threatened with closure across all parts of the world due to heightened pressure on budget and lowering visiting numbers. People of Bangladesh need not only vital information about health, safety, nutrition, and public services, but also want opportunities to develop their literacy, learn skills for employability and take part in collective educational and cultural activities. Considering the scenario, it is well stated that information is essential to survive and prosper, whereas lacking the right information can lead to worsening economic poverty.

On the other hand, emphasizing the need for the physical and the digital to sit side by side, Arts Council England conducting a survey 'Envisioning the library of the future' found that the 21st century library service will be one in which 'local people are more active and involved in its design and delivery' (Arts Council England, 2013). To comply, (Rajkumar, n.d.) stated that digital resources are not going to replace the physical existence of documents completely, but no doubt, to meet the present demand, to satisfy the non-local user, digitization must be introduced so that at least libraries become of hybrid nature.

Thus, the aim of Bangladesh Bank Library (BBL) is to bridge between physical and digital library that incorporates an updated physical collection of books, journals, CDs and DVDs, along with providing users with remote access to e-books, e-journals, e-news clipping and audio-visual files. So it is needless to say that after one or two year, libraries is going to be digitized, hence it is the peak time to all information and library professionals that they geared themselves to take the challenges. Moreover, facilitating access to information not only provide user with the information but also empower them with the rights and capability, thereby paving the path of transparent and accountable governance.

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# Model Community Library O Milon Kendro

(কমিউনিটি লাইব্রেরি ও মিলন কেন্দ্র, Community Library and Assembly Centre)

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**Abstract:** Concept of Community Library O Milon Kendro has been inspired with the projection of local community development to keep pace with globalization as well as Millennium Development Goals (MDG). Widespread and extensive library, Information, community, awareness and government services have been incorporated in this paper to support local population in day to day life which would gradually maximize their standard of living. Since Bangladesh as dynamic nation has already keeping pace with information age and accelerating in social movement the paper has shed the light to maximize the living standards in rural as well as remote areas. The initiative may get started by different phases: with existing infrastructure; plan for sustainability; and long-term plan. Services would be divided by sectors like, public-private, private and government accordingly. Considering the Community Library O Milon Kendro a one-stop service point for local population, the project implementation policy would focus on community development by different support services. Ultimately under-privileged population of rural Bangladesh will have access to information resources and services to support their everyday life and livelihood. A governing body would be formed by relevant Government Office / Ministry to mentor the project which would also include community representatives. Facilities and services would create job and entrepreneurship opportunities for local people accordingly. Ultimately the initiative will be driven by service-oriented social businesses by creating extensive employment and business opportunities within communities which will boost socio-economic conditions.

**Keywords:** Community library, Community development, Information literacy, Learning and education, Community awareness, Social involvement, Local community, Standard of living, One-stop service, Rural Bangladesh.

## 1. Introduction

Based on variety of community requirements in the context of rapidly developing Bangladesh the proposal of *model Community Library O Milon Kendro (Community Library and Assembly Centre)* has originally been prepared for A2I Community Library Taskforce which would focus to local community development, target for learning, and education, social bonding, living standard, and all other aspects of everyday life of the people of Bangladesh. Since our country is accelerating with the pace of information age and becoming one of the dynamic nations to excel in social movement the paper has shed the light to maximum standard of living even in the remote areas. People as social inhabitant are constantly in search of and using information for learning, sharing knowledge, intellectual and social activities, personal and professional achievements, etc. Contemporary library acts as knowledge centre which incorporates variety of actions, services and facilities to support information need of society. Information and knowledge are two very simple words which started evolution in social life and turned our world into global village. This has emerged from the extensive use and sharing of information and knowledge in everyday life supported by information technology. Modern libraries also act as social meeting centre by offering face to face client services, interaction between fellow community members (while visiting library), support social interaction by arranging programs and special events, provide online communication and learning facilities through World Wide Web access. The concept of library has absolutely moved from traditional storehouse of reading materials to multi-dimensional knowledge centre and social meeting point.

The paper on model Community Library O Milon Kendro for the A2I project has been prepared considering Bangladesh is part of above mentioned global village and the entire population deserve to be recognized as well-informed and knowledgeable citizen living in and contributing to this village. The proposed *Community Library and Assembly Centre* would be the gateway to information-literate and knowledge-based society in Bangladesh.

## 2. Background

The concept of library has started by Sumerians, Babylonians and Egyptians with their huge number of secret and intellectual collections dated back to 3600 B.C. but the community library model started in 1890 in United Kingdom which offered library services to extremely remote and deprived neighborhoods. These unique library

services to remote or deprived areas subsequently came to be known as community libraries. It was an effort to move towards the active service-oriented and user friendly library based on community.

Most community libraries as they are known today emerged from the traditional public library model towards the service oriented and user-friendly library system based on community requirements.

The library movement started in Bangladesh in middle of the 19<sup>th</sup> century but the community library movement in Bangladesh evolved in 1960s. These libraries in the Union Parishod or Communities would provide limited services like issuing books, arranging cultural and recreational performances like music, drama, debate, sports, tournaments, etc. Registration and a yearly grant-in-aid sanction provided by Department of Social Welfare are required for commencing these Libraries. However, obtaining registration from government infrastructure of the library was the precondition for such initiative. Globally community libraries have scored distinctly as well as in Bangladesh like, Community Development Library (CDL) – rural resource and information centre, Gonokendro, Amader Gram Learning Centre, Village Readers’ Room (Gram Pathagar), Practical Action, Room to Read, Community Resource Centre, Community Information Centre, etc.

### 3. Concept

Concept of contemporary library has been defined by Beyond Access (2012), as “Libraries and librarians have a history of trusted sources for addressing people’s information needs. Public and community libraries are sustainable local institutions that can stimulate grassroots development. The 21<sup>st</sup> century library is no longer just about books or solely a place for kids. Libraries around the world can and have become powerful partners to help deliver services that enable communities to achieve the Millennium Development Goals (MDGs)”.<sup>3</sup>

Head of Services, Library and Information Services Council (Wales), has expressed a few words about the facility in 2003, which as follows, “We’ve always been a meeting place for people and the heart of our traditional use is the older person often retired, visiting the library on a certain day, once a week. [This] is part of their social life and they will meet other friends. And that is something that we have to take into account in our new library development, we’ve got to ensure we have meeting space. In some places we have refreshments, making sure there are places that they can meet and feel comfortable.”<sup>2</sup>

Concept of Community Library O Milon Kendro has been inspired from Bordertown Community Library, Tatiara South Australia; Blue Mountains Council Library, NSW, Australia; Community Library, Sunbury, Ohio USA; and Douglas County Libraries, USA. Screen copies of such library websites are attached on the last pages of this paper, showing services, facilities, client groups, associated offers, services and facilities. Individual opportunities to experience of such extensive services provided by Blue Mountains Council Library have also encouraged the proposed concept of Community Library O Milon Kendro.

### 4. Aims and Objectives

The inspiration of community libraries have emerged to provide community, information and support services which would be dynamically designed to support local population with day to day lifestyle. Aims and objectives of the proposed *Community Library O Milon Kendro* would be outlined into the following considering the core concept of the Project,

- Information services and facilities to ensure access to elements of better lifestyle like living, education, health, sanitation, environment, trade, agriculture, business, recreational services, and etc.
- Access to a variety of information resources which would support timely information needs, like, government press releases regarding different issues such as security warning, law and enforcement statements, weather forecasts, agricultural and harvesting information, market price of commodities, agricultural product selling and pricing guidelines, entrepreneurship guideline, etc.
- Timely access to a diverse and comprehensive collection of popular learning materials in sufficient quantities and variable formats to community. These facilities would also extend with focus on reaching out to under privileged groups of population / minor groups.
- logical access point and support centre for community based literacy program regardless of creed, race, gender and ages
- Information service and social support would be extensively emphasized on learning, education and development for children, girls , women and especially disabled individual
- Variety of service zone would reflect contemporary library services.
- Reference and referral service through reliable information sources by courteous, knowledgeable, and professionally-trained staff

- Up to date information about local, national and international contemporary issues, important messages, learning materials, publications would be on display for marketing, promotion and local awareness
- Offer unique and cost-effective on payment services which would allow local population to enjoy some facilities with maximum access to information, services and resources, like internet browsing, emails, fax, photocopy, scanning, printing and composing services, reservation of functions, meetings, seminars, ceremonies, etc.
- Organize information literacy sessions to provide opportunity and encouragement for local population of all ages to educate themselves continuously
- Organize educational events for local student community to develop study and learning skills like debate competition, cultural competition, spelling, reading, writing, storytelling competition, etc.
- Network and cooperation among local educational institutions and information resources supplier would strengthen learning and educational ties
- Create opportunities to make the local population aware of the historical and genealogical background, resources and collection which would create job opportunities in local tourism (even if voluntary which would be useful for further job hunt)
- Facilities to organize events for social and cultural interaction, orientation programs for new local infrastructural settlement like, communication facilities, establishment of industries, banks, education facility, health care facilities, which would support local population and might create jobs/ trade opportunities for local people
- Offer support and services as meeting (social gathering) point for social meetings, business meetings, entertainment events, sports events, social functions, seminars, mutual settlement meetings (salish gathering) which would generally serve and facilitate as social (gathering) centre for the community. Provision for community centre on rental basis to assist organizing functions like wedding celebrations, marriage anniversary, re-union, etc. The Centre would offer guest house facility on the rental basis as well for those who wish to visit the area and stay overnight safely.
- Additional facilities like local resort would add the centre to local tourism sector which might offer those who would like to explore and experience remote native living and rural nature. (This idea has taken from examples of developed countries. They provide tourism offers in collaboration with community facilities).
- Facilitate social and religious seminars organized by different well-reputed social and religious bodies to educate local population properly about the tolerance of social-religious beliefs which would be beneficiary to fight any discrimination and mislead (government and qualified bodies might need to come forward to help the community stay out of any misconduct and mislead)
- Health and fitness support which would include indoor - outdoor games, exercise and gym facilities for all ages
- Social support which would include child care, pre-schooling facilities and after school care for working parents which would also create jobs in the community

## 5. Services and functions

The services of the *Community Library O Milon Kendro* are extensive because its functions would be flexible to address the needs of the targeted community. However, services and functions may be specified according to the following facilities:

### 5.1 Library Services

- Extensive library services to meet contemporary information requirements
- Allow members to borrow books and non-books collection for certain period
- Children corner with proper playing and learning items for those who come with children and would like to spend some quality time in the Library
- Story time for kids
- Inter-library loans on user request
- Service to identify user needs
- Arrange periodical movie evenings / documentary shows for entertainment and learning
- Preserve local and national indigenous knowledge, value, culture and heritage
- Create local information resource guide by collecting and preserving data on local issues, like demography, living, birth registration, marriage registration, literacy, agriculture, fisheries, livestock, etc.
- Browsing and searching assistance for online databases

## 5.2 Awareness Services

- Help enhancing learning and education for all age groups
- Facilitate lifelong learning opportunities providing access to information resources
- Arrange information sessions on different issues like weather, public health, community system, livelihood and many more
- Access to information on current trends to help support self education for local people
- Keep aware of local resources and local government, critical issues, citizen rights, etc.
- Provide market information and current price of local products
- Access to basic information on health, sanitation and geography
- Access to basic information on socio-economic condition
- Community radio facility may be offered to air local news, weather news, etc., for example, lokbetar, sundarban
- Arrange adult literacy sessions to support nationwide literacy target
- Act as People's Network point for assisting users in finding information online (mission- nobody will be excluded from information revolution).
- Promote literacy and reading culture.
- Provide referral and out-reach information services
- Arrange events periodically for different age groups like, story events for kids, reading and game competition for youngsters
- Arrange art / pottery competition followed by exhibition to encourage and promote local merits

## 5.3 Paid Services

- Venue as social events / meeting point
- Event support services
- Internet services to access local, national and international job sites and searching assistance
- Promote local products in markets outside the locality through online markets, such as Krishi Bazar
- Support working mothers by providing childcare services
- Support facilities for recreational activities, cultural events and functions by providing community halls on rental basis
- Provision for medical consultancy by community physician
- Provision for games, gymnasiums and swimming pool
- Facilities for refreshments (may be canteen facilities / vendor machines).

## 5.4 Government Services

- Government supported health facilities
- Birth registration, marriage registration, death notification
- Government employment information and processing services
- Government approved overseas employment information and processing services
- Local employment services
- Taxation
- Local information support services
- Public security support services
- Local development support services

All of the above facilities may be offered from different sectors according to the nature of initiative:

Sectors	Services	
Public -Private partnership sector	Library services	Government services may be provided with minimum charges which would also contribute as income generator
	Awareness services	
Private sector	Paid services as sustainable income generator	
Government sector	Government Services	

## 6. Project Plan

The plan would be initially started as pilot projects in 7 Divisions of Bangladesh and eventually would thrive as sustainable and successful accomplishment. The project may be planned and worked out in the following phases for sustainable model.

### *Phase 1*

Existing local library e.g. school, college or local NGO Library may be targeted as the model  
Mobile library may be targeted for remote areas  
Local population information needs analysis  
Identification of immediate action  
Infrastructure support / Internet support from telecommunication sector  
Initial investment by NGOs  
Additional Investment by A2I

### *Phase 2*

Prepare business plan according to need analysis  
Determine income source / self generating income source  
Sustainability plan for the development of education sector for digital Bangladesh

### *Phase 3*

Countrywide replication by social business entrepreneurs  
Long term plan as entrepreneurship

## 7. Project Implementation Policy (Business Plan)

The one stop service point will be connected with Union Parishod, Upazila Office, City Corporation, DC Office, District Public Libraries and Information Centre. Project implementation policy guideline for *Community Library O Milon Kendro* would be based on defined aims, objectives, services and functions which may create the provision of commitment from local people and engaging them actively for effectiveness.

- The entire project will be designed to focus on individual regional requirement in the context of developing Bangladesh as a nation
- The proposal has been prepared with context of establishing *Community Library O Milon Kendro* at least in every Union Parishod of Bangladesh
- The project would be a long term initiative which may have multiple phases to accomplish the ultimate goal
- Phase one will focus on establishing a few well equipped Community Library and Milon Kendro to help realize people that the facility will certainly help improve living standard and prospects of everyday life.
- Arrange wide projections on the initiatives and success through media coverage to encourage national (may be international) entrepreneurs to contribute to the project
- Business entrepreneurs may initiate in their own locality as social and national responsibility
- Entrepreneurs may be given business incentives for their contributions, similar like export achievement incentives from Bangladesh Government
- Entrepreneurs may also be offered tax rebate for their contribution to encourage the initiative as social business
- Successful entrepreneurs may be awarded for their accomplishments (e.g. organization of the year (organization)/ Bangladeshi of the year
- Service policies would be determined by the assessment of local requirements
- Fees and charges of paid facilities and services may be considered as income generating sources for sustainability
- Community radio may be implemented with considerable discount to encourage the set-up by entrepreneurs / initiators
- Library O Milon Kendro website may be developed with all relevant information and accessed from other relevant sites for reference
- Utilize existing community sources and available infrastructure for initial effort of establishment then move on to permanent settlement which would encourage the local initiator to come forward for the project

## 8. Implementation Features of Community Library O Milon Kendro

- Space
- Building/House, safety, & sanitation with local requirements
- Budget
- Governing authority
- Maintenance
- Skilled, dedicated staff
- Effective IT support
- Service areas with requirements
- Furniture / Equipment (Seating arrangements, tables and work stations)
- Restrooms
- Telephone and Internet connection, water, gas, power , sewage
- Patrons
- Space for get-together / Public meeting rooms
- Training room with good trainers
- Lighting (both interior and exterior)/ Switches and controls (light, heat, etc.)
- Walkways /Parking space
- Drinking water fountains
- Cafeteria
- Garden/park

### 8.1 Governing Body of the Milon Kendro

A governing body would be formed by relevant Government Office / Ministry to mentor the pilot project of model *Community Library O Milon Kendro* and periodically report the activities to the concerned authority at A2I. After successfully implemented the pilot project, a governing body may form with the following members for mentoring every *Community Library O Milon Kendro*:

- |   |                  |
|---|------------------|
| • Chairman of Union Parishod/ Upozila Parishod<br>Mayor of Municipality / Chairman of the District Council /<br>Ward Councilor of City Corporation /Mayor of City Corporation<br>Or Entrepreneur/Financer of the Milon Kendro<br>(applicable to locality) | Chairman         |
| • Elected Female member of local government   | Vice Chairman    |
| • Representative from school teachers   | Member           |
| • Representative/s from local religious communities   | Member           |
| • Representative of farmers community   | Member           |
| • Representative from women / girls   | Member           |
| • Local journalist  | Member           |
| • Representatives from student community<br>(one male and one female)   | Member           |
| • Community Librarian   | Member-Secretary |

This governing body may determine the policies of rendering facilities and services of the Community Library O Milon Kendro on the basis of local community requirements which widely support the development of local living standard.

### 8.2 Staff positions

There must be a position for Community Librarian as Head of the Community Library O Milon Kendra. She / he will be qualified with professional degree for professional hands-on expertise and practice.

Staff positions would be determined according to the need basis. Local students/youths would contribute as volunteers which will help as their work experience for future employment.

Some positions may be offered as part-time or casual as per the requirement of the project to accommodate local people.

### **8.3 Resources of the Centre**

Available resources may include,

- Computer and allied accessories for typing, composing, printing, scanning, video conferencing, etc.
- Internet access
- Books
- Music CDs
- Audio Books
- Videos and DVD's
- Globes, Maps and Atlas
- Newspaper /Magazines
- Reference items

### **8.4 Funding /Sources of Fund**

Funding may be sought from following sections/quarters:

- Grassroots development organizations
- Social entrepreneurs/ Business entrepreneurs /patrons
- Donations
- Private Sectors/NGOs
- Public /Private partnership
- Revenue from rental facilities
- Government of Bangladesh may fund a few number of initial establishments as Model Community Library O Milon Kendro on pilot basis and also might provide incentives to motivate initiator.

However, a British writer Christina Stilwell assert that community libraries should be established by the communities themselves- made by them, for them and in their image to succeed and if succeeded it may be run by their own incomes. 4

## **9. Recommendation**

### **First Phase**

- ▶ Primarily the proposed Library would be established in 7 Divisions (Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet) of Bangladesh as pilot (project) models for the entire project.
- ▶ Government of Bangladesh might take initiative to establish a few or all of seven which would be well equipped to set examples of such initiatives and encourage distinguished entrepreneurs and local initiator to take the step.
- ▶ Existing School /college / NGO Library might be considered for initial establishment. Existing services and facilities would be taken care of by providing logistic support which might be financed by the NGOs with the additional supports from A2I. BALID would provide support for training and systemic setup.
- ▶ Initially the proposed project will require media coverage as part of promotional activities to get peoples' attention and introduce to business entrepreneurs

### **Second Phase**

- ▶ Entrepreneurs might initiate in their own locality with approval of Government Legislation. They may get license to start *Community Library O Milon Kendro* as part of social and national responsibility which might gradually be developed as entrepreneurship with some paid facilities like rental community centers, tourism facility, picnic resorts, etc. The original intention of the project to help develop community living standard must be kept safe from entrepreneurship which should clearly identified in the license.
- ▶ A Coordinating body may be formed by Prime Minister's Office to mentor the project periodically and follow the development updates.
- ▶ The entrepreneur may be awarded for successful implementation of the project after the achievement of each phase of the project (might be yearly achievements) which would encourage others to take the initiative on board. Same would be applied for the successful local initiator / govt. officials.

### Third Phase

- ▶ Community Library O Milon Kendro may have collaboration with other familiar community libraries and information services facilities for long term sustainability
- ▶ BALID may provide training for Library personnel and information professional
- ▶ Though this is a long term project, the initiative would help establish businesses across country and open employment opportunities for local people so they might not consider migrating to cities and accepting struggles in everyday life, which would also reduce population pressure on cities and minimize pressure trips toward abroad for better life.

## 10. Conclusion

The proposed features of the *Community Library O Milon Kendro* have been integrated considering the need for information usage in Bangladesh to keep pace with globalization. Variable provision of services may be designed according to individual local requirements. Dynamic, proactive and service-oriented approach would be the vital driving force for the above mentioned project which is certainly the current trend of any organizational success.

Extensive provisions to provide exclusive information and social services are highlighted in the proposal with the vision of establishing **one-stop** community services and facilities which would ensure learning and knowledge development, maximum living standard, social facilities and many more opportunities to local community. Information resources and knowledge-based services will be the wheel power of this project. Ultimately the initiative will be the expansion and driven by service-oriented social businesses by creating extensive employment and business opportunities within communities which will boost socio-economic conditions. Ensuring quality life for rural communities is the vital prospect of the proposed project which would lead Bangladesh to be recognized as knowledge-based nation. The project would require explicit attention from Government of Bangladesh, national leaders, national and international organizations, business organizations, government agencies, and divisional and district level government associates. Ultimately *Community Library O Milon Kendro* should be established by the community itself made by them, for them and driven by them.

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**Notes:** Concepts taken from successful community library systems around the globe, like

- ✦ Bordertown Community Library, Tatiara, South Australia  
<https://www.tatiara.sa.gov.au/page.aspx?u=139>
- ✦ Blue Mountains Council Library <http://www.bmcc.nsw.gov.au/yourcommunity/library>
- ✦ Community Library, Sunbury, Ohio USA <http://community.lib.oh.us/local/index.php?id=6>
- ✦ Douglas County Libraries, USA <http://douglascountylibraries.org/node?page=1>
- ✦ <http://americanlibrariesmagazine.org/features/06132012/community-reference-making-libraries-indispensable-new-way>

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## Successful Community Libraries

### Community Library, Sunbury, Ohio, USA

The screenshot shows a Mozilla Firefox browser window displaying the website for the Community Library in Sunbury, Ohio. The browser's address bar shows the URL [community.lib.oh.us/local/index.php?id=1](http://community.lib.oh.us/local/index.php?id=1). The website features a logo of a person reading a book and the text "Community Library". A navigation menu includes links for home, collections, about, databases, adults, teens, children, and local. On the left side, there is a list of categories: assistance, education, government, history, organizations, and recreation. Below this list, contact information is provided: "Ask a Question", phone number 740-965-3901, email [community-library@oplin.org](mailto:community-library@oplin.org), and a link to KnowItNow. The main content area has a section titled "Local Interests" with a photograph of a large, historic building. Below the photo, the text reads: "Community Library recognizes its role in collecting the local history of the community,".

Community Library in Sunbury, Ohio - Mozilla Firefox


File Edit View History Bookmarks Tools Help

MyWebSearch Community Library in Sunbury, Ohio Ohio Means Jobs - Welcome

community.lib.oh.us/local/index.php?id=1

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Ask a Question  
740-965-3901  
community-library@oplin.org  
KnowitNow



Community Library recognizes its role in collecting the local history of the community, as well as providing access to current information related to the area's growth and development. The following links provide information on resources related to local history, commerce, development and government.

Select local links by topic: Recreation

**Assistance Links**

[Big Walnut Friends Who S](#)  
[Helpline of Delaware & M](#)  
[Ohio Here to Help](#)  
[Ohio Means Jobs](#)  
[Top of Page](#)

ALL LINKS  
Assistance  
Education  
Government  
History  
Organizations  
Recreation

Community Library | 44 Burrer Dr | Sunbury, Ohio 43074

## Event facilities, Community Library, Sunbury, Ohio, USA

Events for Delaware, Sunbury, Westerville, Dublin, Powell and more - Mozilla Firefox

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MyWebSearch Community Library in Sunbury, Ohio Events for Delaware, Sunbury, Westerville... x +

www.delawarecountyevents.com

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Sign On | Newsletter Sign Up | Contact Us

# DelawareCountyEvents.com

Community Events Calendar for Delaware County, Ohio

Home Calendar Post an Event About

Quick Links: Calendar | Search | Newsletter Sign Up

SEARCH:

AdChoices ▶ [Events Calendar](#) [Music Events](#) [Festival Calendar](#) [Holiday Calendar](#)

**Today's Events**  
Wednesday, June 05, 2013

[Adult Walk-In Clinic](#)  
County-Wide - Delaware General Health District

[Full Body Workout](#)  
County-Wide - Senior Citizens Inc. of Delaware County

[Do For Others II](#)  
County-Wide - Senior Citizens, Inc. of Delaware County

[Coffee & Conversation](#)  
County-Wide - Senior Citizens Inc. of

**Upcoming Featured Events**

★ 6/23: [Golf Outing](#) - County-Wide - OSU Alumni Club of Delaware County

★ 7/27: [Community Ties 2013](#) - County-Wide - Delaware County Friends of the Trail

**View Events by Event Type**

* <a href="#">Arts / Theatre / Music</a>	* <a href="#">Fundraiser / Benefit</a>	* <a href="#">Parade</a>
* <a href="#">Business Events</a>	* <a href="#">Health</a>	* <a href="#">Religio</a>
* <a href="#">Children Activities</a>	* <a href="#">Lecture / Workshop</a>	* <a href="#">Senior</a>
* <a href="#">Clubs</a>	* <a href="#">Libraries</a>	* <a href="#">Special</a>

Events for Delaware, Sunbury, Westerville, Dublin, Powell and more - Mozilla Firefox

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MyWebSearch Community Library in Sunbury, Ohio Events for Delaware, Sunbury, Westervil... x +

www.delawarecountyevents.com

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View Events by Event Type

- \* [Arts / Theatre / Music](#)
- \* [Business Events](#)
- \* [Children Activities](#)
- \* [Clubs](#)
- \* [Education](#)
- \* [Festival](#)
- \* [Fundraiser / Benefit](#)
- \* [Health](#)
- \* [Lecture / Workshop](#)
- \* [Library](#)
- \* [Literary](#)
- \* [Membership Meetings](#)
- \* [Parade](#)
- \* [Religious](#)
- \* [Senior](#)
- \* [Special Events / Holiday](#)
- \* [Sports & Recreation](#)
- \* [Other](#)

Delaware County Communities

- \* [County-Wide](#)
- \* [Ashley](#)
- \* [Berlin](#)
- \* [Concord](#)
- \* [Delaware](#)
- \* [Dublin](#)
- \* [Genoa](#)
- \* [Harlem](#)
- \* [Liberty](#)
- \* [Orange](#)
- \* [Ostrander](#)
- \* [Powell](#)
- \* [Sunbury](#)
- \* [Westerville](#)

## Blue Mountains City Library

Community Directory - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Blue Mountains City Council - Library Community Directory x +

bmcc.ent.sirsidynix.net.au/client/default/?rm=LINC50||1||2||true

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THE CITY WITH A WORLD HERITAGE NATIONAL PARK

Blue Mountains City Library

Log In

Everything All Fields

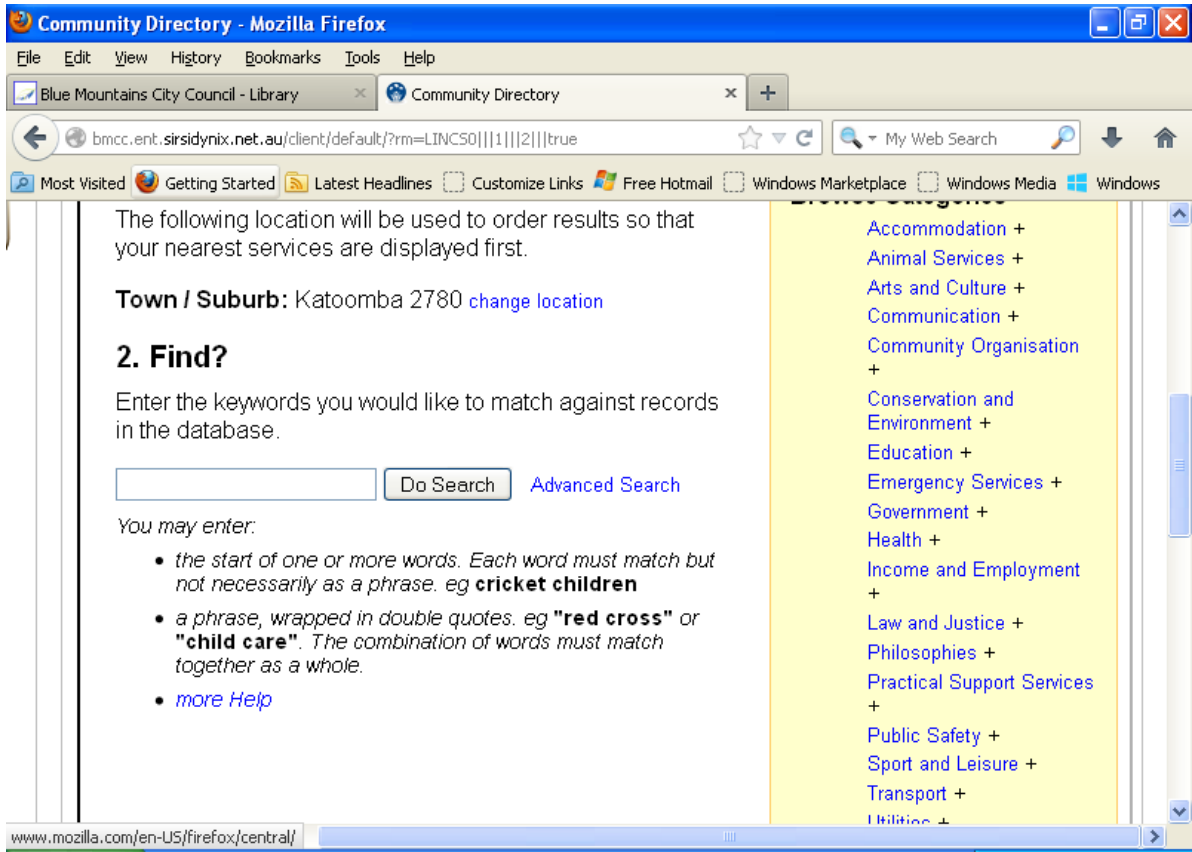
Community Directory

- Blue Mountains City Library
- New Title Lists
- Premium Sites
- Kids Library
- Local Studies
- Recommended Sites
- Community Directory
- Contact Us
- Help

blue mountain City Council Community Directory

1. Check Location?

Brow



# Information Communication Technology Use in the Library of Independent University, Bangladesh: Past, present and future plan

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**Abstract:** This article aims to explore the adoption of Information Communication and Technology (ICT) and reason behind embracing Open Source (OS) solution at the Library, Independent University, Bangladesh (IUBL) finally. This study tries to share the extent of the OS implementation process in brief for the relevant digital service in light of the drawback of previous software execution. IUBL has been involved in applying ICT-based solutions for the management with a range of library functions and services since its inception. As user-centric service provider, for last few years IUBL has engaged in finding solution for changing the traditional ICT-based system. In this process the library staffs have identified the satisfactory direction for better library service. A number of popular OS Integrated Library System (ILS), Institutional Repository (IR) and Discovery Tools have been reviewed and examined to adopt the suitable tools. Among various tools Koha, DSpace and VuFind are preferred as ILS, IR and discovery tool respectively. This paper also illustrated implementation of ABCD software for journal indexing. This write-up demonstrated a successful way out from the library professionals and university library perspective. This study would close the gap and provides guidelines for practicing librarians, policy makers, and management.

## 1. Introduction

Academic libraries, specially university libraries are established for a common operation to fulfill the mission and objectives of their parent institutions which is related to support teaching and learning, research and development (Husain and Nazim, 2015). Research and Developments in Information Communication Technology (ICT) have affected all areas of knowledge and information (Babu et al., 2007). ICT is an umbrella term, to include all rapidly emerging and developing technologies altogether i.e. computer, software, networking, programming and information systems. Globally ICT changed the library services in a spectacular manner. (fotalib, 2013). With the recent development of ICT, academic and research libraries are anticipated more user centric desired services to meet the need of both the users and the library mangers (Woodward, 2009). Globally, ICT has contributed massively to the performance of librarians with the services and functions of the library which includes but is not limited to the collection development, references services, document delivery, access to organized collections, circulation management, serials control, security etc which help in the maximum way to get the benefit for the users (Whatisict, 2015).

In Bangladesh, in the year 1960, the first computer was installed by the Adamjee Jute mill and Agrani Bank Ltd. installed a computer on the same year later. Atomic Energy Centre, in the year 1964 installed a mainframe computer (Islam & Panda, 2009). However, In the early 1980's libraries in Bangladesh started to use computers (Islam & Islam, 2007) by developing and providing bibliographic database services. The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) Library and the Agricultural Information Centre (AIC) are considered pioneers in introducing automation activities in Bangladesh (Khan, 1989). Chowdhury et al. (2011) reported that recent rapid developments in ICT have changed the scenario in Bangladesh which have a great impact on the socioeconomic condition, education, office management, even in the environment of library and information management.

## 2. Independent University, Bangladesh Library

The library of the Independent University, Bangladesh (IUB), was established in 1993 is the major contributor to achieve the university's aim of developing independent learners. The library's mission is to provide user-focused services through the provision for accessing to the recorded knowledge in an environment that foster individual teaching, learning, research and promote exchange of ideas by providing materials, resources and facilities to support students, faculty members, researchers and the general information need of IUB community (IUB Library, 2015). Currently, the library serves about 7,000 users; among them graduate and under graduate students, faculty members, and staffs. Additionally, trust and donor members as well as the alumni also get services to some scales. Most of the collections of IUBL are closely related to the university's courses of six schools, i.e. School of Business (SB), School of Engineering and Computer Science (SECS), School of Liberal Arts and Social Sciences (SLASS), School of Environmental Science and Management (SESM), School of Life Science (SLS) and School of Public Health (SPH) (IUB, 2015). The IUB Library holds more than 26,000 printed books, about 4,000 CD/DVDs, a large quantity of audio/video cassettes. The library has access to approximately 21,000 titles of e-resources, subscribed through two local consortia and independently. At present the library has subscription to a good number of local and international printed journals and periodicals.

## 3. Status of ICT at IUB

Independent University, Bangladesh has been giving significance on the use ICT to ensure state-of-the art facilities and services. In IUB, a unit named Central Information and Technology Services (CITS) is responsible for providing the development, promotion, and maintenance of software, hardware, and network infrastructure as well as the operational tasks related to IT. A very up-to-date IT infrastructure with high speed broadband connections (uplink 50 mbps and downlink 80 mbps), Wi-Fi connections with adequate number of access point, fiber optic facilities as a network backbone with a local area network (LAN), a number of high configured brand servers (about 35) like Domain Name System Server, Dynamic Host Configuration Protocol Server, Mail Server, Web Server, Authentication Server, Database Server, Proxy Server, etc. and more than 1,000 workstations and 200 laptops with the latest versions of software and tools. All the schools specially SECS and SB have a great arrangement of IT facilities. All other schools, different departments, institutes, and the library also have excellent facilities for using ICT with modern digital communication and technology.

## 4. E-resources of IUB Library

ICT is a vital component for information management which is required for use and manage E-resource effectively. Beside the in-house resources, the library has subscription to quite a large number of titles of e-resources. IUB Digital repository <http://dir.iub.edu.bd:8180> hosted a good number of digital institutional resources. Being a member of Bangladesh-INASP-PERI consortium, IUBL has access to American Chemical Society, Wiley Online, EBSCOHost, SpringerLink, Astronomical Journal, American Physical Society, Institute of Physics Publishing, American Society of Civil Engineers, Mary Ann Liebert, Inc. Publishing, Annual Reviews, Beech Tree Publishing, Cambridge University Press, Oxford University Press and so on. The library also subscribed Emerald full-text and JSTOR through UGC Digital library. Additionally, the library subscribed ABI Global of ProQuest independently. Besides, the library has registered all four HINARI, OARE, AGORA and ARDI resources of Research for Life which ensures free access to huge electronic resources. The library also has access to e-databases of World Bank WDI, GDF, ADI, GEM and so on. Moreover, library has access to E-books of DeGruyter LIS books collection and ProjectMUSE books 2013 complete collection.

Earlier, IUB library purchased licensed version of EndNote X7 in July 2014 to support the researchers of IUB to manage citations, bibliographies and references electronically.

IUB library maintains an individual webpage <http://www.lib.iub.edu.bd> which has necessary links to the subscribed e-resources. Initially, the IUB Library Webpage was designed with Dreamweaver and HTML and launched in 2003. In March 2012, the library launched a new interface of its website using Drupal. The new website serves as a platform for browsing OPAC <http://opac.iub.edu.bd>, managing and accessing electronic journals, databases, electronic books and selected online resources <http://lib.iub.edu.bd/?q=node/22>. The interface of the library website has been designed with an objective to make the collection more accessible to its users.

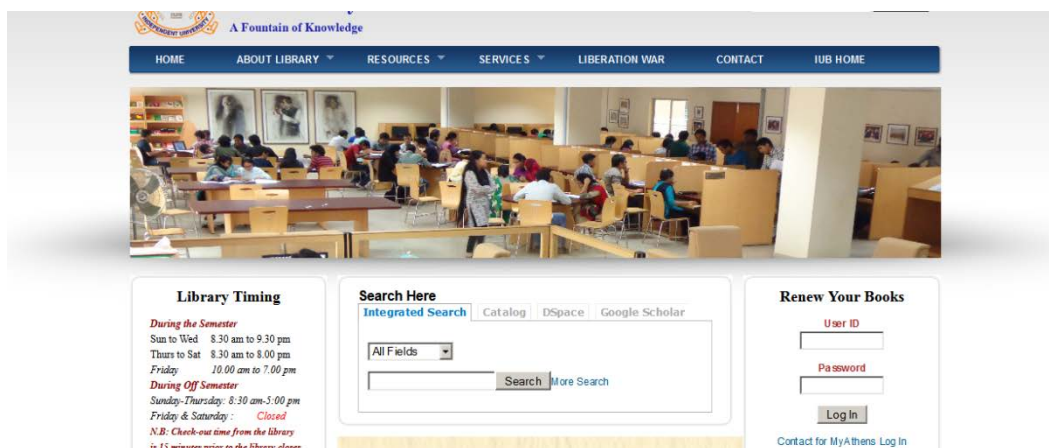


Figure 1: IUB Library web site with integrated search option

In the library website the Drupal Quick Tabs module has been used to create blocks of tabbed content, specifically views, blocks, nodes and other quick tabs using jQuery for integrated and individual search.

The library has about 70 internet connected computers which are mainly dedicated for using electronic resources. As subscriptions are IP-based, so all students, faculty members, researchers and administrative staffs can access full-text databases from any of thousands of computers at IUB campus. To ease remote access to e-resources, IUB library subscribes MyAthens.

## 5. Objective of the Study

Though the scope of the ICT is wide but this paper shared the software adoption issues for providing effective library services. In Bangladesh, open source software specially ILS, OPAC and IR adoption are very recent phenomenon. The need for the availability and accessibility of scholarly materials, along-with the resources, bibliographic descriptions of the resources in both offline and online mode of libraries of their own is immense. While detailed technical discussion is beyond the scope of this paper, however, it is based on practical knowledge of implementation and technical assistant provided by the library professionals of IUB for open source ILS, IR and Discovery tool adoption along-with the experience and evaluation of previous systems. This write-up will help to examine the challenges and prospects to the implementation phase which is relevant to strategic decisions too.

## 6. Previous ILS Shortcomings

In most of the cases the term library automation is synonymous with the term computerization. The automation of library tasks were mainly related to the completion of tasks and services with the assistance of computer. Though nowadays more other smarter ICT-based solutions are in use in the library. Use of ICT, i.e. computerization in IUB library has been started since its inception. The IUB library had been using CDS/ISIS to manage library databases locally since 1993. For online search, GenISIS Web was being used during 2005-2009. A customized ILS for local use was being used which was developed by using MS Access in the year 1998. It was basically used for circulation, acquisition purpose and serial management. Yet this ILS is in use for acquisition and serial management. In the year 2001, Librarium, a customized ILS, developed by IUB Computer Science students by using Oracle, Visual Basic and Crystal Report. As ISISs were used for searching library catalog, on the other hand Librarium was for circulation only. There were huge limitations of all the programs functionally. Librarium was used for circulation mainly though searching was possible there and ISISs was for searching library resources. There was no way to know the present status or availability of resources. Though Oracle has its own Report facility but it was absent in the Librarium. MS Access and Crystal Report was being used for report module. Also, the report module, an important tool for libraries, was not available in Librarium. IUB Library was fulfilling the report function by using Microsoft Access and connecting with Oracle, the main library database. Additionally, there was no bibliographical standard and no harvesting procedure of data. It was very laborious and time consuming to operate different modules as all were sub-standard, discrete and incomplete as ILS. Moreover, lack of OPAC module, lacking in patron management, lack of fine management, non-standard Cataloguing module, lack of data interoperability, lack of features connected to Bar-code and Patron ID card generations, moreover lack of a true next generation integrated library system. So, a true ILS which is efficiently "integrated", including acquisition, cataloguing, circulation, and other technical and administrative activities, was much for functioning the library effectively.

## **7. Previous IR Shortcomings**

As both are a type of information retrieval system, the terms digital library and digital repository are synonymous. Earlier, SECS used to host a digital repository in the year 2005, basically for thesis and reports. It was named “SECS Digital Library,” which did not fulfill the proper purpose of a digital library or digital repository to the users due to some major limitations, i.e. lack of user-friendly searching and browsing options, metadata handling, self-archiving, multifaceted formats, Open Archives, metadata harvesting, data migration, interoperability, user handling, access management, etc. After developing a standard repository, the researchers, teachers, students, stakeholders of the university or other users will be able to access digital resources provided by this repository; moreover, the repository can make an impact to the researchers, teachers, and students as it disseminates the publications, increasing the visibility of research output and consequently the department and the institution.

## **8. Previous Journal Indexing Shortcomings**

IUB library has been receiving a good number of titles of international and national printed journals/periodicals every year. To maximize the visibility and usability of printed journal/periodicals, IUB library had indexing articles of journals and newspapers using CDS/ISIS since 1996 named DStor. But for the lack of suitable platform those data were preserved and maintained as in-house database locally. Though an attempt was taken to make it available through GenSIS Web, but there was some limitations specially searching, browsing, and metadata handling. In this age of software revolution, ISIS appeared as obsolete and back-dated tool for handling data as more user-friendly web-based tool of need. So, requirement for a suitable software for indexing journal and periodicals was the demand of the librarians and users. A software which can be served as an ILS and repository simultaneously was the priority. Now, journal/periodical index is maintained through ABCD.

## **9. Necessity for Discovery Tool**

Though there was no discovery earlier, but there was always a requirement at IUBL. Multi-faceted complex resources are a concern for the library managers. Resource discovery has a mechanism of identifying and accessing required and relevant information for the user. Irrespective of the location, storage and authority, a variety of resources are represented as per user’s requirement through web service and content integration through discovery system. Like most other university libraries, IUB library also has a growing number of local and online collections. They are mainly traditional print, electronic journals and databases, digital repository and web pages for scholarly resources. All those have growing number of delivery systems with their own interfaces. OPAC, institutional repository, multiple databases and e-resources sites and extensive web sites. This multiplicity of interfaces make difficult for the users to utilize fully what is available to them. So, the library staffs investigated the solution to overcome this setback and decided to adopt VuFind. So, as a pioneer of utilizing ICT at library it is very justified to do such task for better access to resources in an effective and novel manner.

## **10. Methodology of Choosing Suitable Software**

To choose the acceptable OS ILS, IR and Discovery Tool of IUBL needs, evaluation was made considering software licensing, software category, community, functionality, operational and technical complexity, maturity, sustainability, reliability, and interoperability (Müller, 2011). There are a number of OS ILS, IR software packages and Discovery Tools available. For ILS, Koha, Evergreen, ABCD and NewGenLib; for IR, EPrints, DSpace, Greenstone and Fedora; and for discovery, VuFind and Blacklight are mentionable. After reviewing the literature and observing the comparison of the different functionalities, architectural and feasibility analysis, and direct technical hands-on examination suitable software package were adopted. All the authors of this paper tested the above mentioned software packages in local servers to analyse the functionality. Finally, all the library professionals have given their consent for Koha, DSpace, ABCD and VuFind for adoption at IUBL.

## **11. Reason for Migration to New Software**

Recently, the structure of library resources has changed with the development of information and communication technologies. Traditional resources are replaced by the in-house and external digital resources. Software that used even in ten years ago are nowadays become obsolete due to the changes of technology, accessibility, variety of resources, and library manager and patrons need. All the ILSs do not perform the required tasks what librarians are looking for. It has been mentioned earlier that IUB ILS and IR also had short

of functionalities which were common for any library. In case of ILS, globally as many of those are lack of actual flavor of a true and effective integrated which should be conformed with the different basic modules of ILS i.e. acquisitions (ordering, receiving, and invoicing materials); cataloguing (classifying and indexing materials); circulation (borrowing and return back); serials (managing and tracking journal, magazine, newspaper etc.); the OPAC (access to catalogue by end users) and web 2.0 facilities (Sulaj, 2015). So it is the demand for the users as their information seeking patterns have been changed for last few years. Their demand match with the new approach and user-oriented environment to access the library resources. “Next Generation Catalog” is an approach where few librarians adopted any new ILS with keeping side by side a discovery tool. Though discovery tool integrates all the formats, types and carriers but few ILS also act as the access point too. Beside the main functions, interactive functionalities are also expected to be present in modern ILS, like suggestion, self-checking, renewal, hold, reviewing and annotating a resource, provide active user input in other ILS modules. The service quality and user satisfaction is influenced by a good interactive ILS. Both proprietary and open source ILSs are available in the market. Though all ILS have a lot of common features but they are certainly different in their functionalities and maturity. Flexibility is required for any software so that any technological updates and important issues can be adopted, thus change may be done in the ILS. As Proprietary ILS are typically costly and have restrictions, Open Source ILS are more effective solution when the libraries are running under budget-cut environment. It is mentionable that, IUB library had explored several world leading ILSs with the demo and pricing from the vendor in 2005; among them Liberty and Voyager are notable. So, like ILS, top ranked OS IR and discovery software are also getting priority for their features and functions. More about the advantages of OSS may be described elsewhere.

So, in case of IUB library, the migration from previous ILS and IR to new OS is basically for -

- i. Not fulfilling the criteria or requirement by the old system, i.e. CDS/ISIS and Librarian
- ii. Backdated and obsolete software and hardware of old system
- iii. Lack of flexibility, lack of support and no upgradation of old system (Macan et al., 2013).
- iv. Absent of standards for bibliographic data
- v. Poor functionalities, laborious maintenance of old system and financial restrictions
- vi. Updated features, functionalities for new software
- vii. Better change requirement and of further modification for new OSS
- viii. Openness to customization and to support from user community for new OSS
- ix. Better usage and distribution option for new OSS than proprietary software

As ICT plays a vital role for the development of library, so in this financial restriction and availability of technology with mature products, OSS is suitable both developing and developed countries. There is always a freedom of choice, usage and distribute of the required software by the librarians to provide better and innovative services to meet users needs.

## 12. Functionalities of Adopted Software

### 12.1 Integrated Library Software (Koha)

Implementation of Koha ILS is a major achievement for IUBL. IUB Library users and staffs are experiencing much functionality after implementing Koha, Dspace, VuFind and ABCD. Regarding Koha ILS, though IUB library doesn't use all the module due to lack of few administrative and technical procedure, but the modules those are in use, running very effectively.

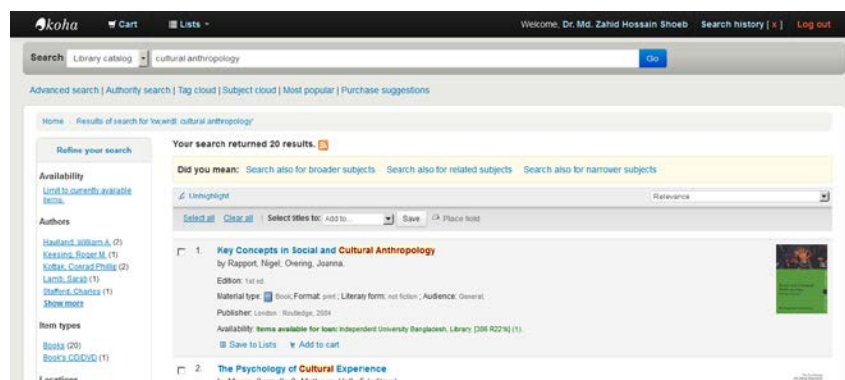


Figure 2: IUB Library OPAC

It may be mentioned that, IUB library explored a lot with acquisition and serial management modules, those are assumed as incomplete and inappropriate got for this library. However, the most functional module is the circulation module of Koha made it possible to send circulation confirmation messages, place hold messages and overdue notices to users. Text/SMS messages to patrons are also possible. From the OPAC users library staffs receive different messages, i.e. 'purchase suggestion' and 'place hold' messages. Thus, library staff became more conscious of and informed about their services. Z39.50 makes the cataloguing easier as importing bibliographic information through this service saves time and labour, this is not only for book, but also for serials or other resources. Printing barcodes and call number labels through Koha saves the time of the library staffs. Report module gives a variety of statistics in different format. Any sort of customized report on any module can be generated. OPAC functionalities also give the user the real time status of library items. Users can search in both basic and advance option by using different Boolean search operator. Additionally, users are able to make lists and carts in the OPAC which they can print, e-mail and download. Place hold, tagging, purchase suggestion, message customization, renew items, reading history can also be done in the OPAC. These features are much helpful to the users (Ahhammad, 2014).

## 12.2 Institutional Repository (DSpace)

Adopting IR is another milestone of success for the IUBL. As DSpace offers a concrete and sustainable infrastructure for the library, it is a huge task yet to take the task of archiving intellectual output and administrative documents for the benefits of IUB community.

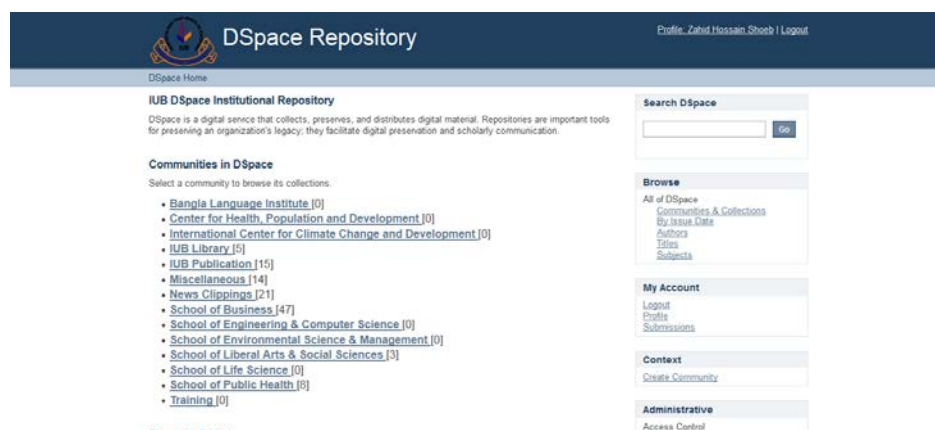


Figure 3: IUB Library IR

Additionally, it is needed to explore the total functionality as well to make the marketing of this service. The tangible and intangible benefit of IUB will be immense after making the IR full functional by collecting and curating digital output. This IR undoubtedly opens up the university to the global intellectual and academic audience which will maximize the visibility of the university. IUB research and academic activities can be also be assessed by utilizing IUB IR (Shoeb, 2010).

## 12.3 Journal/Periodical Indexing (ABCD)

Perhaps ABCD accomplishment and data migration from ISIS to ABCD is the first time in Bangladesh by IUB library. Though ABCD is being used as test basis. But it is quite possible to use as ILS and digital library by the same software.

ABCD is compatible with MARC21, Dublin Core, METS and other current standards. For ABCD acquisition module where libraries can set up budgets and create vendors database. Though it is needed to explore whether it can be cope with the local policy. The Serials Control (SeCs) module provides a tool for managing journals where all kinds of publishing patterns can be managed. The loan module, report and statistics , administrative tasks, security also make a strong player in the field of ILS.

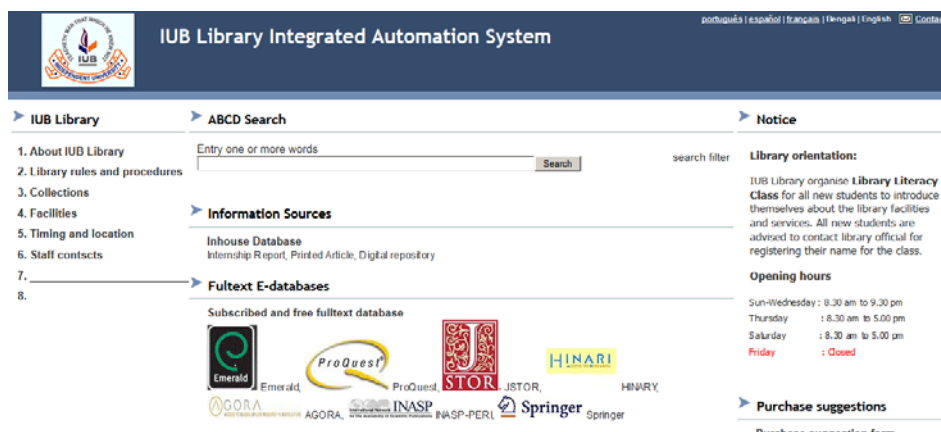


Figure 4: IUB Library journal indexing ILS

### 12.4 Discovery tool (VuFind)

VuFind interface offered many improvements over classic OPAC. IUB library User can search all the integrated resources through one search.

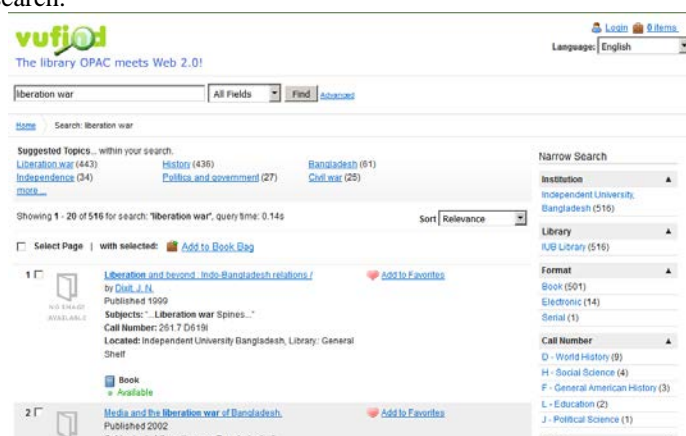


Figure 5: IUB library discovery tool

Faceted search results allow users to narrow down items by the keywords. User can see the live records status and location very fast for the functionality of AJAX. When viewing a record, the user will be offered and suggested similar records. Bookmarking, tagging, Open Search, OAI, Solr providing VuFind more user friendly and user centric search facilities are available in the discovery tool (Rahman, 2012).

## 13. Future Planning of IUB Library

IUBL always tries to implement the latest ICT-based services comparing to other developed country library to provide better services to meet up the ever changing demand of the users. In pursuing so, the library is trying to train up its professional through international training and collaboration. This trend will also be given preference in near future. Regarding ILS, as Koha Acquisition and Serial module is not fully functional yet due to the mismatch of institutional acquisition policy, so it is considered to make it usable after eliminating the barriers. In case of IR, the library intended to enhance strategy of marketing to engage faculty members and researchers of IUB community further to contribute to the repository collections. In addition, the library is supposed to classify its resources namely institutional repository and institutional memory. In VuFind, the users are able to search and browse resources as per their requirement. But in case of electronic journal, user can access up-to journal level index but no article level. The library is eager to have a discovery system to get access to full-text articles. Concerning IUBL website, the design and functionality will be emphasized on more access to resources, research support, navigation, better interface and more informative. For indexing, ABCD will be hosted on Linux live server to make it public and more usable along-with full-text access. For ensuring resource security, the library is supposed to implement RFID technology in its premises. The library is discussing with the university management regarding the matter. Possibly this will be implemented through the university's central initiative.

## 14. Conclusion

So, for providing better and user-centric library service the most acceptable resolution is to adopt reliable and functional library software. Though this is difficult task to accomplish and many challenges are to face in rapidly changing ICT environment but nothing is unworkable. Whether it is a small library or large academic or research library from the beginning it should be considered to adopt standard, customizable, flexible, sustainable and functional ICT solution. The software being used by IUB library rarely required money. But with these tools a resourceful and service oriented library may be developed and enriched. The technology that has been using by IUBL is constantly being updated and customized to meet the need of the library. So, now, it is time to give up the old, traditional products for computation or automation for library services and to play with the current and emerging trends of easily available OS resources. The library staffs of IUB have the expertise and skill to play with the resources, to embrace the tools.

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# Automation of Resource Management of Central Library of BUET: Procedure of Implementation of ILMS

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**Abstract:** The resource management of an academic library is a challenging performance for a library systems and services. The characteristics of library service and systems are changing rapidly in the digital environment. In this point of view BUET Central Library has developed an integrated resource management and digitalization of its resources. Regarding the characteristic of resources of BUET Central Library the software (S) as well as hardware (S) are installed and established. In order to implement a complete library system and services in modern aspects, a series of work flow had to be maintained which was a great challenge. It is useful to study the implementing procedures of modern library management systems. Software selection, determination of hardware, study of integration system, conversion procedure, switching to previous system to new system and other activities are a great challenge to establish an integrated resource management system.

## 1. Background and Present State of the system

The collection, preservation and dissemination of resources of the BUET Central Library has been practicing with standard methods of AACR, DDC, standard Subject-Headings etc. from the very beginning of its establishment. It was continuing the book processing and bibliographic services using CDS/ISIS. In the year 1999 the library itself developed Visual FoxPro based software to extend the computerized library systems but it could not run successfully. Next according to necessity it had developed an Oracle based integrated library software named BUETLIB using barcode along with website provision in 2004.

But the reality was that the resources of the library were not coded using the international MARC standard. On the other hand the services were also not running in full standard way. Considering these the library had to define the following requirements:

- i) To develop an Integrated Library Management System software
- ii) To build up a sustainable digital collection of own publications, dissertations of BUET
- iii) To connect the BUET Central Library to the knowledge sharing network of the globe.
- iv) To enhance the teaching and learning environment providing sufficient facilities of internet browsing
- v) To set up the Integrated Library Management Systems using the RFID (Radio Frequency Identification)
- vi) To build up a library security system using RFID Access Control Gate

In order to fulfill the requirements, it was important to study the total scenario of the resources of the BUET Library.

The details of the resources of BUET Central Library are stated below:

Resources	Quantity
Books, Standards, Manuals, Year Books Reports, etc.	1,33,767
CD, DVD, Audio-visual materials	1532
Hard Copy Journals (Bound Volume)	18911
Total Current Titles of Journals (Hard Copy)	28
E-Resources (Journals, Books etc.)	More than 40 thousand
Thesis/Dissertations ( Post Graduate)	3945
BUET Publications	465
Faculty Members	644
Students	8655
Officers & Staffs	43

After defining the requirements, the implementation activities were selected and according to a strategic plan the activities were done that are stated below:

## 2. Implementation

It was a delightful event that BUET Library was awarded a sub-project of HEQEP by University Grant Commission (UGC) funded by the World Bank and through this opportunity the above requirements were able to fulfill. It was a great challenge to get the award because the proposal had to face a tight competition among the participating universities. However, in order to implement the requirements, the library had to furnish the following activities:

- A. Selection of Software and Integration:** In order to establish an integrated library systems and services such as acquisition, processing, circulation, serial control, reference service etc., a number of software (s) like Koha, DSpace, VuFind etc. had to be selected, customized and integrated.

The aims and related software(s) are described below:

Serial	Purpose / Aim	Name of the software
1.	Integrated Library System	Koha
2.	Institutional Repository	DSpace
3.	Federated Searching	VuFind
4.	Content Management System	Drupal
5.	Converting, inserting & editing of data	MarcEdit
6.	RFID-based Security Management	Provide by vendor along with necessary protocol

- B. Customization of software:** Customization of software (s) was a great task to furnish the library systems and services. Koha and DSpace had to be customized according requirements of library activities specially.

- C. Digitalization of Resources:** The dissertations (Post graduate) and publications of BUET, the important rare items of the library which were scanned and uploaded into IR for the users' full access with the searching facilities.

**D. Expansion of existing network :**

- Preparation for high traffic expected from off-campus users
- Wire-less access in and vicinity of the library
- Building a stand-alone fixed-IP-based web-server system

**E. Development of RFID Systems:** New Approach to Circulation, Tracking, Inventorying and Security of Library Materials

- Fast and smooth charge and discharge of library materials- no optical sensitivity
- Check-out & check-in library materials without staff assistance
- Provide the facilities to users to check-in library materials on holiday using book-drop.
- To verify that all material leaving the library has been checked-out
- Quick finding of missing items in the book selves using portable data manager.
- Integration to access-control system keeps away unauthorized entry in the library

**F. Selection of the Hardware (s) :** The following essential hardware(s) and IT equipment(s) had been needed to select and procure :

SL	Name	Purpose
1.	Computer (s)	For workstations and other services
2.	Server (s)	Data storing, data backup & institutional repository
3.	Scanner	For institutional repository and other services.
4.	Projector	For orientation, training and workshop
5.	Laser Printer	Printing
6.	UPS	Smooth power management
7.	On-Line UPS	Non-stop power systems for server
8.	Proximity Card Printer	Printing RFID patron's card

SL	Name	Purpose
9.	ICT Network equipment	Improve the existing network systems
10.	RFID Tag	For using in the books and CD's
11.	RFID Gate	To Establish RFID Security System
12.	RFID Desktop Reader	To Establish RFID Circulation System
13.	RFID Hand Reader and Antenna	To Establish RFID Tracking System
14.	Self check in check out station	To perform self check in check out
15.	Book drop station	To perform check in during holy days
16.	Network equipments with Wi-Fi modem	To establish a easy and available internet facilities

## OVERALL SYSTEM ARCHITECHTURE OF CENTRAL LIBRARY OF BUET

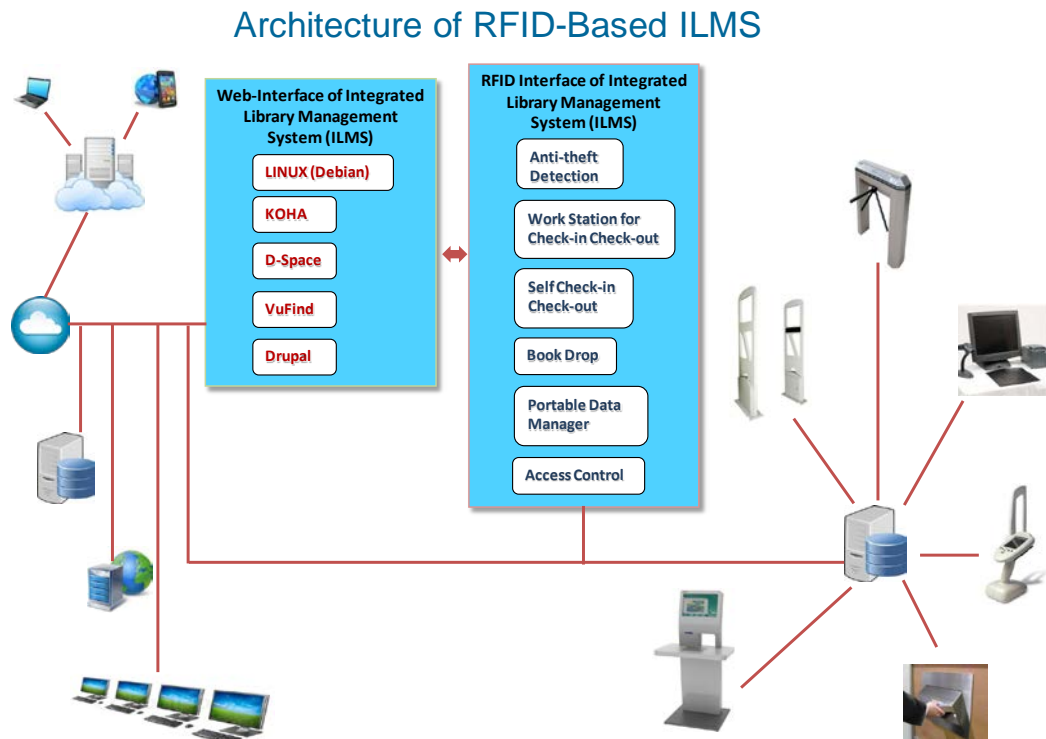


Figure 01: System architecture of BUET Library

- LMS Software
- MARC 21 Data Entry
- RFID Circulation System
- RFID Access Control
- Server Systems for Hosting Programs
- Workstation for Service to Users

### 3. Challenges

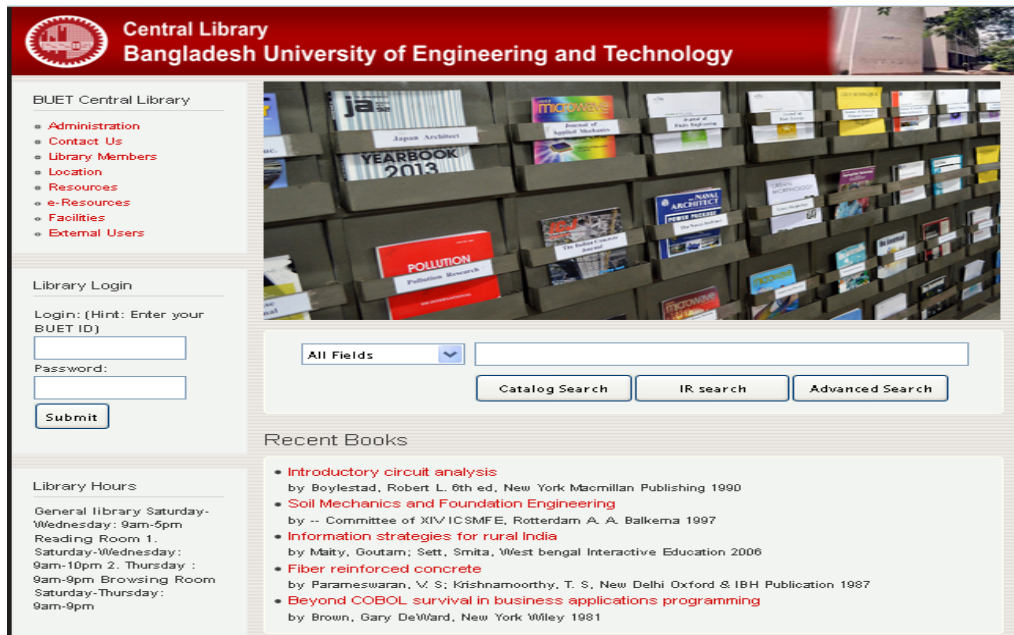
There were significant challenges that had to face:

- Instability of planning
- Inadequacies of professional literacy
- Knowledge sharing
- Design of systems, e.g., LMS, RFID system, ICT Network
- Preparation of detail technical specification, quantities, and prices with speculated budget
- Complete the tender process in a strict and timely manner.
- Dealing with vendors - mismatch in providing goods/services in terms of schedule
- Data entry management
- Institutional Repository Management
- Serial Management

## 4. Achievements

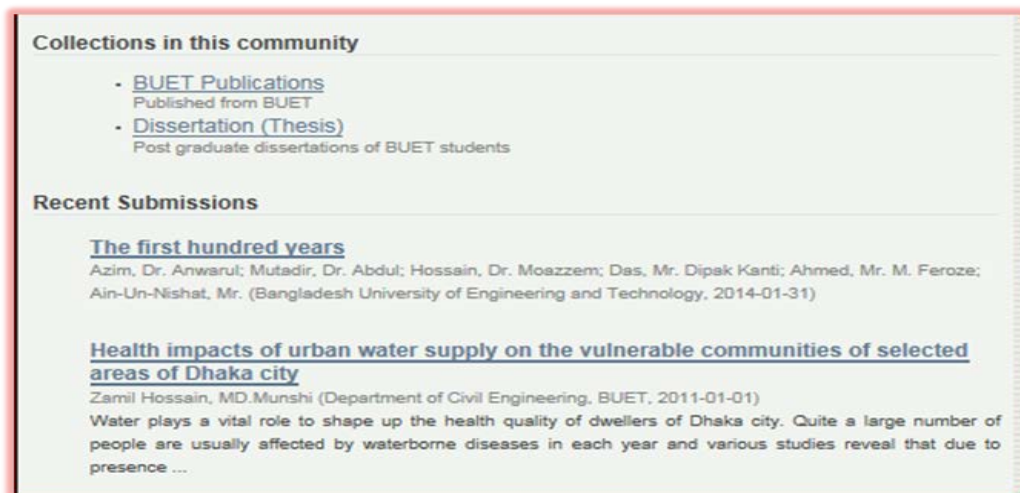
After crossing the challenges and working according to plan we have achieved the followings:

### 4.1 CMS for Library



- Advance searching of catalog/IR/accessible to e-resources
- Log-in access to OPAC
- Reviews and updates of users

### 4.2 IR for Library



- Uploading of BUET publications and dissertations etc.
- Quick access of resources of BUET
- High impact of BUET publications is expected

### 4.3 Output of RFID based circulation system

#### RFID-Based Circulation Systems



Workstation



Self-Check



RFID-Gate



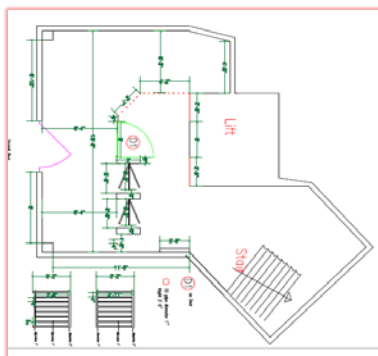
Portable Data Manager

Book-Drop



- Introduction of unique smart card for users
- Workstation for circulation
- Self Check-in & Check-out
- RFID Gate for automatic security management
- Portable Data Manager for detecting misplaced item
- Book Drop Station for off-hour transactions
- Email notification for transactions

### 4.4 RFID-Based Access Control System



Design



RFID access control gate



- Access control RFID gate for security management
- Smart RFID card used for access control

## 4.5 Digitalization

### Digitalization and instant document delivery



Network Scanner

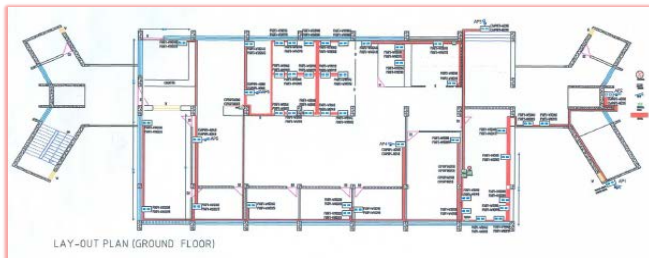


High Speed Scanners

- Cutting, scanning & rebinding the hardcopy of theses
- Uploading the full theses in IR
- Bibliographic data entry of the uploaded theses
- Instant document delivery using network scanner

## 4.6 Speedy Networking System

### Expansion of ICT networks for speedy networking



Design



Wi-Fi Points



Switch



Server

- New routers & cabling in each floor to handle high-bandwidth for data
- Expanded Wi-Fi zone in the vicinity of library
- Access points for RFID operated component or any IP-based device
- Fixed-IP address for central library for remote access

**Getting the achievements it is needed to study a comparative statement between old system and new system**

<b>Serial</b>	<b>Task</b>	<b>Old System</b>	<b>New System</b>
1.	Book issue and return	Through staffs in minutes	Through both staffs, self-check, book-drop in seconds
2.	Circulation notification	Only in printed copy	Both in email and printed copy (check-in/out, reservation, alerts, sms, etc.)
3.	Security Control	No	Yes
4.	Purchase request	Manually done only from the departments	Online suggestion by any active BUET affiliate
5.	Cataloging	Manually enters all data	Fetch authentic data from international libraries in addition to manual entry
6.	Institutional repository	Only bibliographic data	Full text of the dissertations
7.	Searching	Only catalog search	Federated search including catalogs, repository, and e-resources
8.	Webpage	Traditional	CMS - Easy to handle by librarians
9.	User identification	Optically sensitive barcodes	RFID-card used for both LMS and access control

## **5. Conclusion**

The aim of this study is to experimentally understand the methods of making a successful Integrated Library Management System through a project. In order to switch from traditional library system to modern web-based system, a series of activities have to be maintained. This study will be a helpful tool for this purpose. The determination of requirements, implementation procedures, and the challenges are defined in this study which are almost common for any project regarding Integrated Library Management System.

# Discovery to Delivery: Web-based library services of icddr,b

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**Abstract:** icddr,b library is the pioneer in Bangladesh for adapting digital tools and technologies in order to meet the ever changing needs and expectations of its research communities. The number of e-resources facilities and services in electronic format is growing increasingly in the library due to advances in information technology. The main objective of this article is to examine the present status of significant Information and Communication Technology (ICT) infrastructure development of icddr,b library including web-based library facilities and services. Besides, this study investigates the various forms of digital collection building procedure are being practiced in icddr,b library using proprietary and open source software. Finally, the present study explores the e-resource usage status of icddr,b and discovers the challenges and prospects of developing digital resources management at icddr,b library.

**Keywords:** Internet, Computer Communication Networks, Digital Libraries, Software, Information services, Library services, icddr,b, Bangladesh.

## 1. Introduction

The emergence of Information and Communication Technologies (ICTs) has coincided with an excellent opportunity for libraries creating new pathways of information resource-access centers in this present 21<sup>st</sup> century digital library environment. ICT with its tremendous telecommunication networks, rapid transmission speed and easy access ensures the satisfaction of the user with complex information seeking behavior, break down the distance barrier and shortened the time required and ensure the right information to the right reader at the right time. In this present technology based information society, the dream of icddr,b library is to develop a modern world-class knowledge resource centre and provide innovative and web-based library services and collections to their clients. Web-based library services are provided using Internet/Intranet as a medium and library website as a gateway with the help of web-based library automation software. Web-based library service is another vital feature that provides library facilities and services through Internet. The library website is designed to provide online reservation, search library collections, rules and regulations of using library service and user guide etc. The icddr,b library has grown over the years to be one of the best medical libraries in the region. The library has rich collections, particularly; a broad range collection of e-journals has enriched the library. It is committed to deliver world-class library and information services to meet the information needs of scientists and researchers and contribute to society through the pursuit of education, learning, and research at the highest level of excellence.

ICT and digital revolution has radically changed the libraries in the 21st century. In early 1990's, online public access catalogs (OPAC) originated at Ohio State University in 1975 and at the Dallas Public Library in 1978. During the mid- 1990's, CD-ROMs appeared. In the late 1990's, the Internet became the life blood of information sharing and e-book reading. At that time e-books were read by downloading Amazon first version of the Kindle. Today we are in the digital era, with the emergence of Web 2.0, Library 2.0, RSS, Blogs, Wikis, SMS, digital repositories and cloud information management system , availability of e-resources, Web based library platform, Open Access (OA) digital repository, etc., libraries worldwide have been adjusting to the shift from the printed era to the digital era (Jain, 2013). icddr,b library possesses a vast collection of such type of digital resources. This library belongs to, out of four types of libraries, special category of library. It is a journal-based library since it deals with advance level researchers and scientists.

## 2. Background

The Cholera Research Laboratory (CRL), set up in Dhaka on 5 December 1960, was internationalized, through the promulgation of a national Ordinance, as the International Centre for Diarrhoeal Disease Research,

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Bangladesh (icddr,b) on 6 December 1978, which was formally inaugurated on 1st July 1979. Researchers at the Centre have made major scientific achievements in diarrhoeal disease control, maternal and child health, nutrition, HIV/AIDS, food and water borne diseases, chronic diseases, communicable diseases, Vaccine Sciences, population, urbanization and climate changes. These significant contributions have been recognized worldwide.

The icddr,b Library was established in 1962. A five year project proposal named DISC project initiated in May 1982 and this was considered as a remarkable achievement for icddr,b library (icddrb library file, 1982). Mr. M. Shamsul Isalm Khan, former head of icddr,b library, taken major initiatives and achieved success towards introduce ICT facilities and services in icddr,b as well as other organizations in Bangladesh. The implementation of DISC project was the turning point of icddr,b library and most important ICT facilities of icddr,b library was achieved.

Modern libraries are presently faced with challenges as a result of the introduction of new information technologies which has led to an increase in competition among information providers. Libraries must improve the quality of their services to enable them face the challenges of information explosion in the 21<sup>st</sup> century. Service oriented organizations have identified the customer or user as the most critical voice in assessing service quality. For assessment of service quality to be effectively carried out in medical libraries, it is imperative to investigate what new and modern information services are available to users. In this regard, icddr,b library is running to a separate section as Library and Information Services Section (LISS) under direct management of icddr,b. It occupies presently about 6,000 sq.ft floor spaces with modern ICT tools and technologies and has a total of 08 staff members.

### **3. Objectives of the study:**

The present paper explores an attempt to briefly describe digital resource management workflows and web-based library services available in icddr,b library. The specific objectives of this study are:

1. To explore the present status of significant ICT infrastructure development of icddr,b library including facilities and services.
2. To highlight the digital collection building procedure through Institutional Repository (IR), automated library, library consortium, OPAC, Intranet, subscribed and registered online e-Journal platforms, online databases and open access environment.
3. To discover quality research measuring tools for providing qualitative information services and to reveal the e-resource usage status in icddr,b.
4. To share (obtain and deliver) resources nationally and internationally through network activities.
5. To identify the challenges encountered towards the development of digital resource management system in icddr,b library.

### **4. Methods**

This study is mainly based on the personal observations and experiences of the authors. Both qualitative and quantitative methods have been carried out to retrieve various old data from icddr,b library official files. Besides, in order to investigate how researchers of icddr,b use e-resources, a total of 150 researchers were surveyed using a structured questionnaire. The questionnaires were distributed among the researchers of icddr,b. 93 responses were received for a response rate of 62 percent. The collected data from a portion of that study have been analyzed and interpreted by using the descriptive analysis techniques of SPSS and Microsoft Excel program. We have also used Endnote software for managing the reference in this article.

### **5. Scope of the study:**

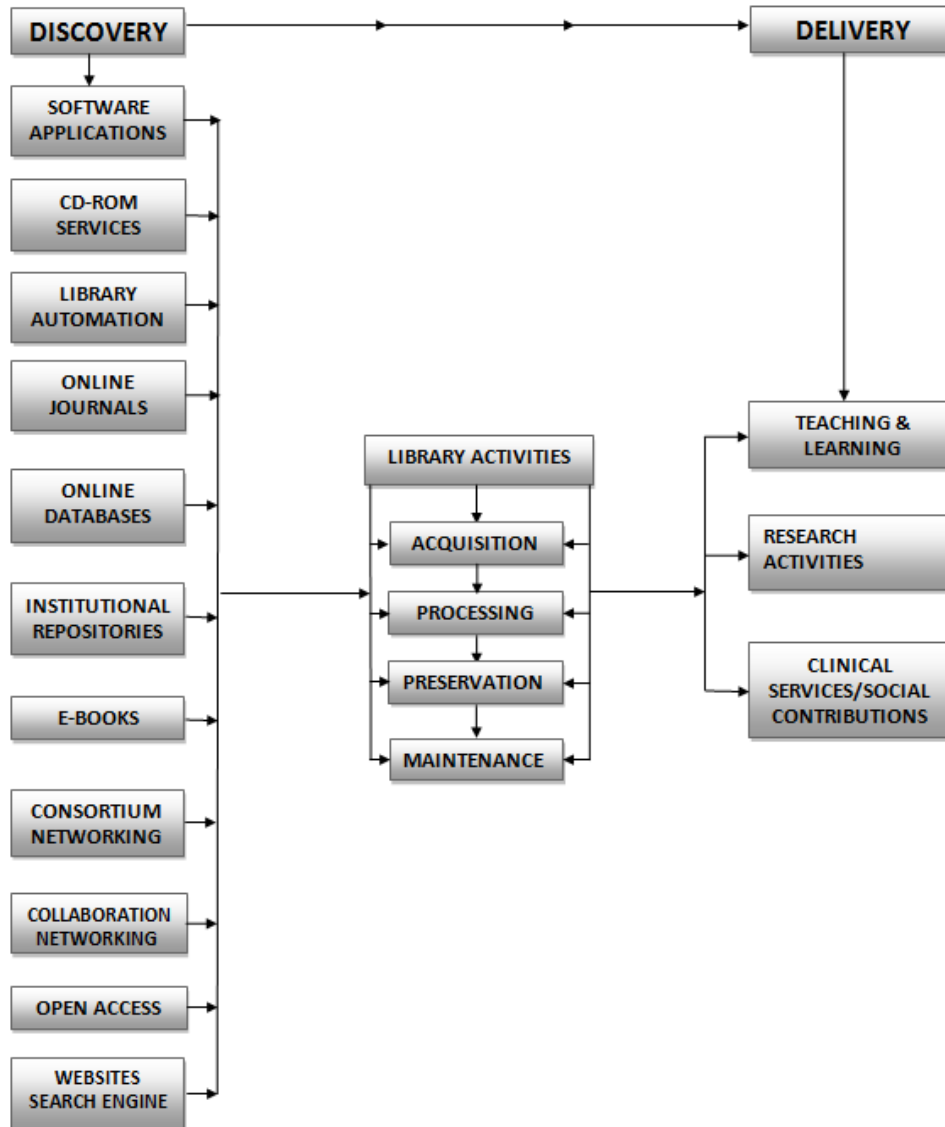
The study will cover the historical growth and ICT infrastructure development of icddr,b library as well as digital resource management system, innovative library facilities and services and usage status of e-resources in icddr,b.

### **6. Discovery of digital collections and Delivery of services:**

To keep pace with modern technology based world, icddr,b library is prioritizing to discovery of e-resources and delivery of speedy services to the scientific communities efficiently. Discovery of e-resources is a systematic and exhaustive search for online resources with the help of Internet/Intranet. icddr,b library is adding e-resources to its collections since e-book publishing has been growing rapidly around the world. Discovery of e-

resources are becoming more popular at icddr,b library because of its various innovative features like search ability, ease of making copies, perceived up-to-date, space-saving, multiple users, easy to share, bookmarking, quality graphs/colour , faster, more convenient in 24 hours\*7 desktop access , solution to hard-copy supply problems, able to get a book quickly, reading facility while traveling or commuting and so on.

The main theme of our paper is *Discovery to Delivery* that means how we discover digital information, how we manage and how we deliver this information to our research community. The whole process of discovery of e-resources and delivery of services of icddr,b library can better be illustrated through the following figure (Sivathaasan & Velnampy, 2013):



**Figure 1: Discovery of digital collections and delivery of services of icddr,b library**

## 7. ICT Infrastructure and Facilities:

The concept of developing the digital library system is moderately new in Bangladesh. In Bangladesh, we have more than 80 public and private universities, over 1,200 colleges, and about 600 organizations and institutions involved in research and related activities. These organizations and institutions have libraries, but most are run in a traditional way. About 100 libraries have been using IT to carry out various library-related activities, including creation of databases (Khan & Uddin, 2006). Digital libraries in the developed countries started during the 1970s, but in Bangladesh, probably it began in the mid-1980 with the installation of library automation

system. In 1993, Internet revolution has made good shape for digital library development in Bangladesh. The overall digital library initiative in Bangladesh is not at a satisfactory level so far. Though some leading private university libraries and special libraries have been made significant attempts towards digital library initiatives such as getting databases on CD-ROM, developing Institutional Repositories, integrating library systems, subscribing to e-journals and online databases and networking through library consortium (Rahman, 2012). In Bangladesh, icddr,b library is the pioneer of using ICT facilities in libraries. As earlier mentioned, a five year project proposal named DISC project conducted in May 1982 and this was considered as a remarkable achievement for icddr,b library. icddr,b management prefers to select commercial software for managing integrated library system using qualified Dublin Core metadata. Major infrastructure development of icddr,b library was achieved by the implementation of this project. The historical growth and significant ICT infrastructure and facilities at icddr,b library are highlighted below:

**In Magic:** The icddr,b library, in fact, led the library profession of the country in implementing the computerization of libraries in Bangladesh. It started its computerization program with the installation of In Magic in 1987 and continued to 1988 (Chowdhury & Khan, 2011).

**CDS/ISIS:** In 1989, the Computerized Documentation Service/Integrated Set of Information Services (CDS/ISIS) software was introduced in the icddr,b library. It organized a two-week training program with the support of UNESCO for developing manpower in the use of the software (Chowdhury & Khan, 2011).

**Alice for Windows:** This library migrated from CDS/ISIS to Alice for Windows on 14<sup>th</sup> January 2004 as the maintenance support for this software is provided by Softlink Asia Pvt. Ltd. from New Delhi, India ("Alice for Windows," 2004). We chose this software for the following reasons:

- Windows based & GUI Complaint client
- LAN and WAN enabled client server interface
- Multi-user, user friendly and multilingual
- ANSI Z39.50 Complaint
- Retro conversion from CDS/ISIS
- Extraction of record from any MARC format
- OPAC
- Provision for digital resource management
- Report generate
- Financial management

**Liberty:** Recently, on July 2015, this software is introduced in the library to manage the digital and print resources and other library activities and services. Liberty is a fully web based information management solution. It enables information centre to be available to all staff, including librarians, head office staff and telecommuters via a web browser using simple web based navigation.

We have selected this software for the following key conditions and benefits (Liberty: our experience your library, 2015):

- **Users' license:** This is very important condition for using commercial software. Users should have to know about negotiation skills to determine how many users will get functional and administrative privilege for managing various modules of the software.
- **Fully integrated:** Liberty is a fully web-based and completely integrated solution.
- **Latest technology:** Liberty is built on world leading technology which facilitates integration with other systems, offers high-level security and fast response time.

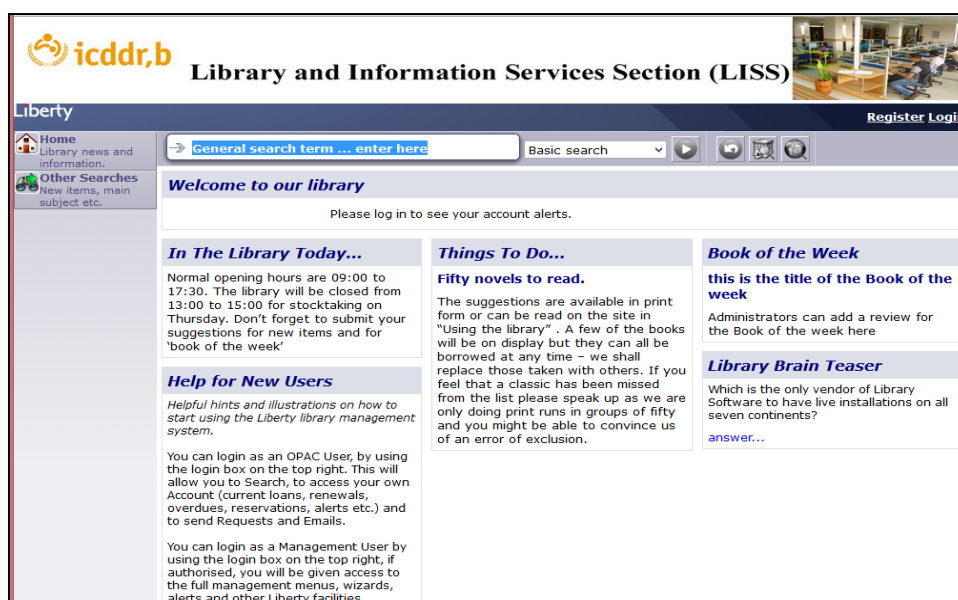


Figure 2: Liberty interface of icddr,b library

- **Flexible and Customizable Interface:** Liberty offers a wealth of functionality and usability straight out of the box. It also offers an unprecedented level of customizability to meet unique library requirements.
- **Resource Management:** Liberty has in-built functionality to manage and schedule all library resources and assets.
- **Accessible:** Liberty provides 24 by 7 "access anywhere" availability for library staff and library users.
- **Interactive Library Maps:** OPAC search results can include links to the shelf location of a copy; Liberty user can have several maps to represent different sections, levels or buildings.
- **Boolean Catalogue:** Liberty gives the facility of searching across various campus sites through single catalogue interface.
- **Data Conversion:** Ease of Data Conversion from CSV, MARC, PubMed
- **Functional Modules:** The following functional modules of Liberty are seamlessly integrated and are provided in the core product to facilitate data sharing and information exchange:

#### Modules of Liberty software

Acquisitions	MARC21
Circulation	Reporting
Inter-library Loans	Client Management
Inventory	Serials & Journals Management
Web OPAC	Z 39.50
Customization	Cataloguing
Digital Preservation	Multilingual

### 7.1 ICDDR,B library Internet site

Library websites have become the main point of access and catalyst for new web-based library services. A library website is a virtual public face, the quasi equivalent of the front door, signage, pathfinders, surrogates to the collections, services and it is used as a window to the world wide web (WWW) (Diaz, 1998). It also serves

as an integrated interface to a wide variety of digital resources and web-based library services for users over a network (Letha, 2006). We have developed our library Internet site using Joomla 2.5 and it is in under development. The site looks like below:

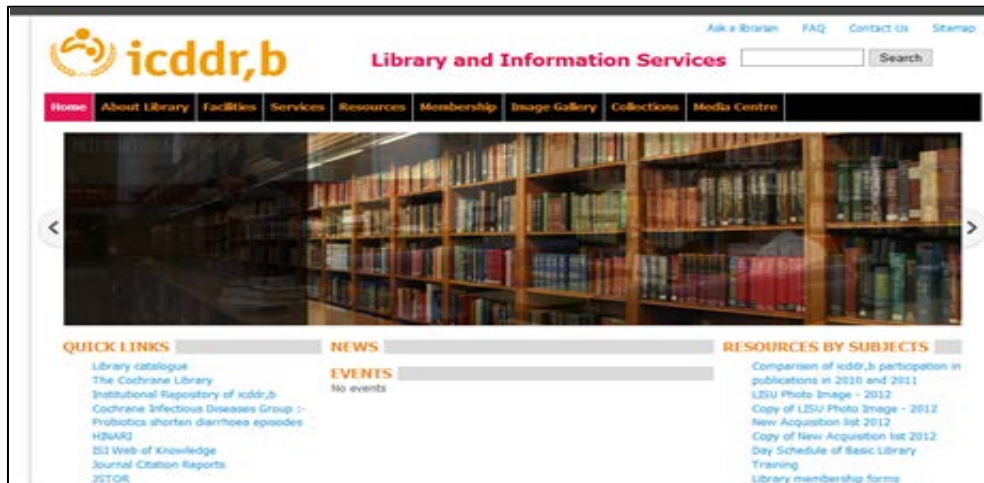


Figure 3: icddr,b library Internet site

## 7.2 RFID Technology

ICDDR,B library is under process to implement RFID technology by which we will be able to tracking of materials throughout the library efficiently, including easier and faster charge and discharge, inventorying, and materials handling. This system will be available in icddr,b library in a short span of time ("icddrb library file," 2015).

## 7.3 Wi-Fi access

Three Wi-Fi routers are available with the range of 100 sq. m. in the library. Password is required to use this Wi-Fi.

## 7.4 Other key facilities

The whole library is under air-conditioning system. A total of five latest reproduce machines are connected with Local Area Network. Facilities for photocopying and printing are available through these machines. There are 15 computers at Cyber Corner inside the Library. Facilities for browsing Internet and Intranet are available. Library has the provision to organize training programs for icddr,b researchers to enhance their skill. Training programs are organized for literature search on the Internet. This will help researchers to save time to get desired reading materials. Internship program is available in the icddr,b library for the students of the Dept. of Information Science and Library Management (ISLM). Facilities of using EndNote software are available for the researchers of icddr,b. icddr,b library has inter-library loan facilities. Information about new arrival books to the researchers of icddr,b, library initiates a circulation systems where images of books with bibliographical information are used. Liberty is the library management software used by icddr,b library, where facility of book reservation is available through OPAC. Facilities for personal membership, corporate membership, and Institutional membership are available for outside users. Guidance facility to the new users is available to use the library resources properly.

## 8 Digital resource management systems

Modern web-based and digital library technologies are deployed in icddr,b library in providing twenty-first century library and information services for strengthening research activities of the icddr,b scientific community. Specially, medical related books, documents, monographs, printed journals, online journals/e-journals are subscribed and managed by this library for providing support to research work of scientists. For managing e-books, e-journals and online databases especially for medical sector, this library is the pioneer in Bangladesh. The icddr,b library digital resource management system are maintained by the following ways:

01. **Digital Preservation through Liberty:** The lifecycle of Digital Preservation through Liberty are shown below:

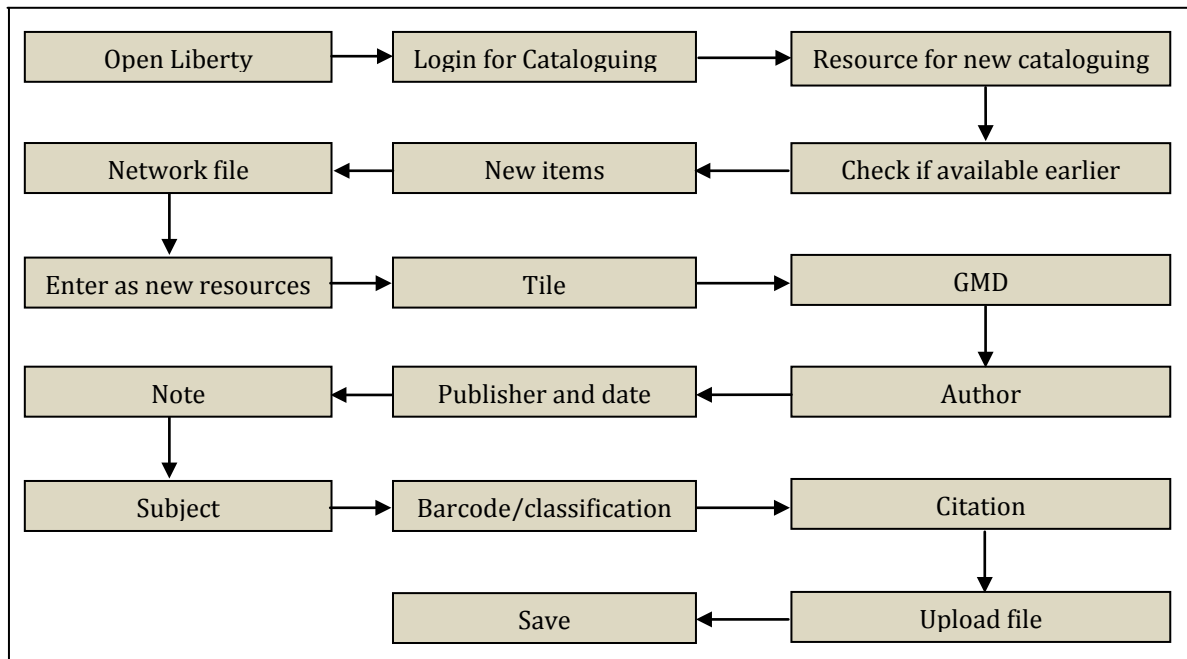


Figure 4: Lifecycle of Digital Preservation through Liberty Software

02. **Library Intranet site using SharePoint 2013:** Microsoft SharePoint 2013 Sites provides portal and collaboration capabilities across intranet, extranet, and Internet sites, bringing users together to share information, data, and expertise across teams, departments, and organizations. With SharePoint 2013 Sites, users are able to work more efficiently and effectively by easily accessing critical information and collaborating with co-workers and partners. In this site, we have linked all the subscribed, registered, free and open access online databases. Library users can able to access this site through icddr,b domain. The screenshot is here:

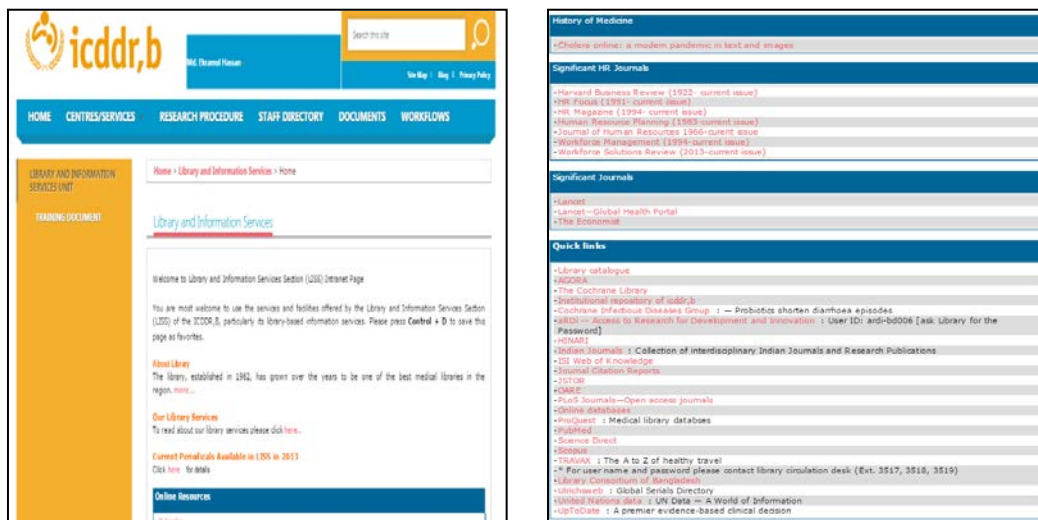


Figure 5: icddr,b library Intranet site

03. **Implementation Science Repository using SharePoint 2013:** icddr,b has taken an initiative to build a web-based Implementation Science repository under the TRAction project that is maintained and developed by library with a support from IT department. The Repository will host both peer and non-peer reviewed publications of icddr,b, Bangladesh and South Asia ("icddr,b library file," 2015).

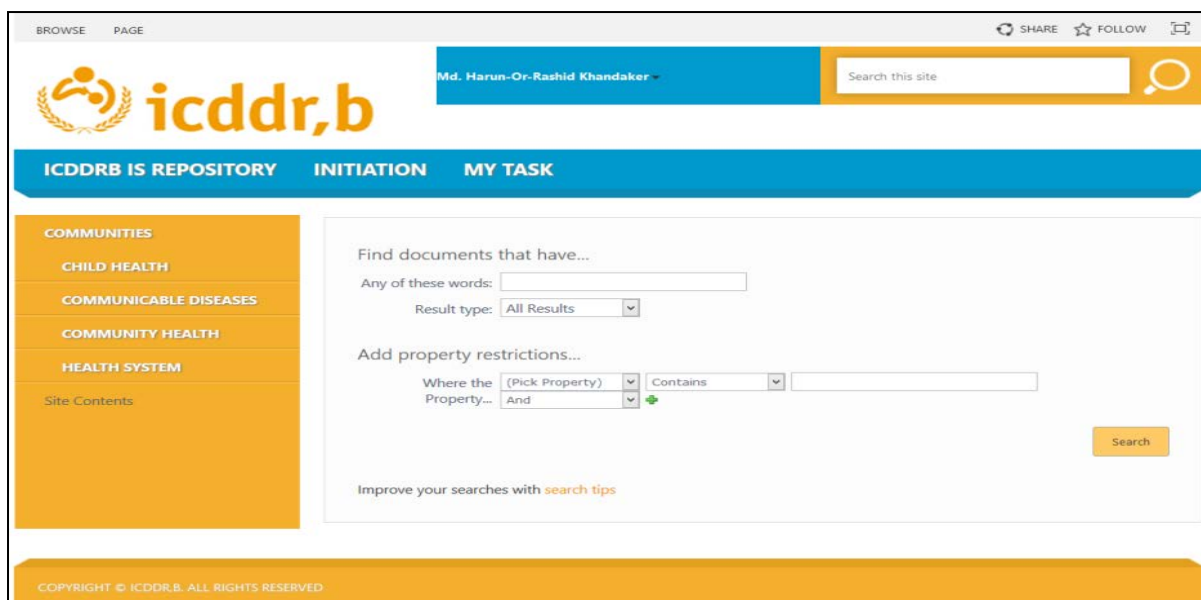


Figure 6: icddr,b Implementation Science repository

**04. Institutional Repository of icddr,b:** icddr,b library has its own Institutional Repository (IR) using DSpace software. This institutional repository is a system where we store digital information and its descriptive "metadata". Its main purpose at icddr,b is to capture and preserve research and related content and to make it available online.

icddr,b repository is an online open access collection of research outputs, data and other activities of icddr,b's scientists, doctors, researchers, fellows and staff members as well as icddr,b. Institutional repository is a database with set of services where intellectual works, literature, articles, technical papers including unpublished materials are stored in digital format for long time with facilities of self-archiving and open access to institutional scholars and research organizations. Since 2005, icddr,b maintains this Institutional Repository (IR), where research outputs of scientists, researchers, and staff members of icddr,b are made available to all scholars across the world.

In 2005, the authority considered establishment of the IR, which was the beginning of establishing of its digital library. Finally, LISS started the IR project with the help of the open source software, DSpace. DSpace is a digital repository system for storage of digital information and its descriptive metadata. icddr,b encourages its scientists to put their research data as well as other useful information to enrich the system. Currently, ICDDR, B maintains 14 communities for its IR, and the number is expected to grow in future. The external publications of ICDDR, B scientists are not accessible due to copyright act of the journals (Chowdhury, Uddin, Afroz, & Sameni, 2011).

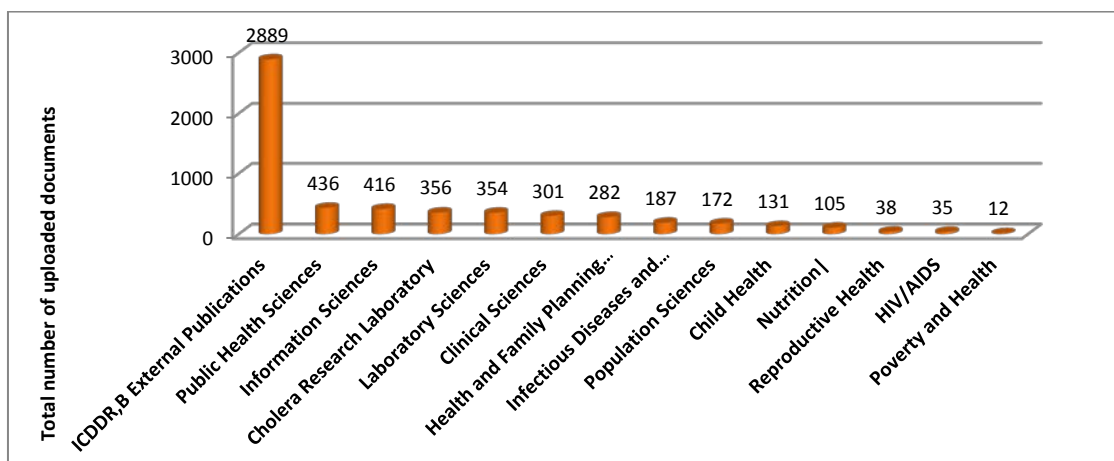


Figure 7: Present status of icddr,b Institutional Repository

## 9 Digital Collections

There is explosive growth of digital resources/e-resources and mobile devices (Smart phones, iPads) and applications to drive user demands and expectations and they are changing the way information is delivered and accessed. Digital resources or E-resources represent an increasingly important component of the collection-building activities of libraries that require computer access, whether through a personal computer, mainframe, or handheld mobile device such as e-journals, e-books, online databases etc.

The major digital collections of icddr,b library are four types:

1. Open Access resources
2. Subscribed e-resources
3. Complimentary resources
4. National and international collaboration

### 9.1 Open Access (OA) Resources

Peter Suber a dedicated promoter of the OA movement defines OA as "Open access to scientific articles means online access without charge to readers or libraries. Committing to open access means dispensing with the financial, technical and legal barriers that are designed to limit access to scientific research articles to paying customers" (Suber, 2002). The OA model promotes free exchange of scholarly publications. It cut down the costs for libraries, which is very important for developing countries. Articles published in OA model are free of copyright and licensing restrictions. In OA model, author retains copyright to his / her article and gives consents for its availability in OA, thereby removing all legal barriers that exist in commercial publications. Researchers in developing countries will benefit the most from OA to the scholarly literature. OA model offers an opportunity for searching, cross-searching, citation analysis, and other value-added services such as monitoring and measuring impact, productivity and quality. The major open-access digital resources are listed below (Uddin, Koehlmoos, & Hossain, 2014):

**Table 1: Major open access platforms in the world**

Sl. No.	Name of the publisher	URL
01.	BioMed Central	<a href="http://www.biomedcentral.com/info/about/whatis">http://www.biomedcentral.com/info/about/whatis</a>
02.	The Public Library of Science (PLoS)	<a href="http://www.plos.org/about/index.php">http://www.plos.org/about/index.php</a>
03.	Bioline International	<a href="http://www.bioline.org.br/info?id=bioline&amp;doc=about">http://www.bioline.org.br/info?id=bioline&amp;doc=about</a>
04.	MedKnow Publications	<a href="http://www.medknow.com/aboutus.asp">http://www.medknow.com/aboutus.asp</a>
05.	Project Gutenberg	<a href="http://www.gutenberg.org">http://www.gutenberg.org</a>
06.	SPARC	<a href="http://www.arl.org/sparc/about/program-plan/index.shtml">http://www.arl.org/sparc/about/program-plan/index.shtml</a>
07.	Directory of OA Journals (DOAJ)	<a href="http://www.doaj.org/doaj?func=loadTempl&amp;templ=longTermArchiving">http://www.doaj.org/doaj?func=loadTempl&amp;templ=longTermArchiving</a>
08.	Open J-Gate	<a href="http://www.openj-gate.com">http://www.openj-gate.com</a>
09.	Bangladesh Journals Online (BanglaJOL)	<a href="http://www.banglajol.info/">http://www.banglajol.info/</a>
10.	The Directory of OA Repositories – OpenDOAR	<a href="http://www.opendoar.org/about.html">http://www.opendoar.org/about.html</a>
11.	PMC Journals	<a href="http://www.ncbi.nlm.nih.gov/pmc/journals/">http://www.ncbi.nlm.nih.gov/pmc/journals/</a>
12.	American Chemical Society	<a href="http://pubs.acs.org/action/showPublications?display=journals">http://pubs.acs.org/action/showPublications?display=journals</a>
13.	PhysNet	<a href="http://de.physnet.net/PhysNet/journals.html">http://de.physnet.net/PhysNet/journals.html</a>
14.	arXiv.org	<a href="http://arxiv.org/">http://arxiv.org/</a>
15.	HighWire	<a href="http://highwire.stanford.edu/lists/freeart.dtl">http://highwire.stanford.edu/lists/freeart.dtl</a>
16.	Strategian	<a href="http://www.strategian.com/free_full_text_articles.html">http://www.strategian.com/free_full_text_articles.html</a>
17.	Wikipedia	<a href="http://en.wikipedia.org/wiki/Main_Page">http://en.wikipedia.org/wiki/Main_Page</a>
18.	CUL Historical Math Monographs	<a href="http://ebooks.library.cornell.edu/m/math/index.php">http://ebooks.library.cornell.edu/m/math/index.php</a>
19.	Mathematics Book Online	<a href="http://www.ams.org/samplings/math-history/math-history">http://www.ams.org/samplings/math-history/math-history</a>
20.	Health Education Library	<a href="http://wellnessproposals.com/wellness-library/health/">http://wellnessproposals.com/wellness-library/health/</a>
21.	IAMCR open access journals	<a href="http://iamcr.org/open-access-journals-newsmenu-322">http://iamcr.org/open-access-journals-newsmenu-322</a>
22.	African medical journals	<a href="http://indexmedicus.afro.who.int/Journals/Indexj.htm">http://indexmedicus.afro.who.int/Journals/Indexj.htm</a>
23.	NepJol	<a href="http://www.nepjol.info/">http://www.nepjol.info/</a>
24.	SLJOL	<a href="http://www.sljol.info/">http://www.sljol.info/</a>

## 9.2 Subscribed e-resources

ICDDR,B library subscribes a good number of e-resources that falls into two categories i.e. subscription of e-resources based on the demand icddr,b scientific communities and to become a member of library consortium. Not a single institution in Bangladesh could afford the institutional membership to any major medical, engineering, or technology collections; such as ACM, IEEE, Elsevier, Academic Press journals, and proceedings. After 1992 Private University Act, many private universities particularly some top ranking universities came forward and emphasized to establish an automated modern library in respective premises with all IT facilities i.e. computer network, Internet, and email, etc. (Uddin & Chowdhury, 2006). In order to make available of research publications with minimum cost, especially for scientific publications in developed and developing countries, Bangladesh Academy of Sciences (BAS) takes an initiative to collect electronic resources through International Network for the Availability of Scientific Publications (INASP). To overcome this problem icddr,b library is a member of the Bangladesh INASP- PERI Consortium since 2007. There are many e-resources available for icddr,b Library through the Consortium. The subscribed e-resources are presented in the following table.

**Table 2: Subscribed e-resources of icddr,b library**

<b>Sl. No.</b>	<b>Name of the e-resources/ Online databases</b>
1.	ISI Web Of Science
2.	ProQuest
3.	JSTOR
4.	UpToDate
5.	TRAVAX
6.	Ulrichsweb
7.	ASM Journals
8.	Cochrane Library
9.	EBSCOHost including CMMC
10.	Nature Publishing Group Journals
11.	Palgrave Macmillan Journals
12.	Springer eJournals
13.	NRC Research Press Journals Online
14.	University of Chicago Press
15.	Cambridge Journals Online
16.	Wiley Online Library Full
17.	Wiley Online Library SSH
18.	Wiley Online Library STM
19.	Indian Online Journals

## 9.3 Complimentary Resources

The complimentary resources are accessible from icddr,b library intranet site which users get access through our IP address and password as well. Complimentary resources are mainly based on the program called Research4Life. The Research4Life resources are mentioned below.

**Table 3: Complimentary online platforms of icddr,b library**

<b>Sl. No.</b>	<b>Name of the online platforms</b>
1.	Health InterNetwork Access to Research Initiative (HINARI)
2.	Access to Global Online Research in Agriculture (AGORA)
3.	Online Access to Research in the Environment (OARE)
4.	Access to Research for Development and Innovation (aRD <i>i</i> )

## 9.4 National and International Collaboration

ICDDR,B Library has collaboration and partnership programmes with national and international level. This programme facilitate sharing of knowledge and resources. Below table shows icddr,b library national and international collaboration activities for obtaining and delivering e-resources vice-versa.

**Table 4: National and international collaboration activities of icddr,b library**

Sl. No.	National collaboration	International collaboration
1.	National Health Library & Documentation Centre (NHLDC)	Royal Tropical Institute (KIT) Library
2.	Bangabandhu Sheikh Mujib Medical University (BSMMU) Library	British Library for Development Studies (BLDS) Digital Library, Institute of Development Studies (ISD) based at the University of Sussex, UK.
3.	Bangladesh Institute of Research & Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) Library	Association for Population/Family Planning Libraries and Information Centers – International (APLIC-I)
4.	Bangladesh College of Physicians and Surgeons Library (BCPS)	
5.	Institute of Epidemiology Disease Control and Research (IEDCR)	
6.	Institute of Public Health Nutrition (IPHN)	

## 10 Library services

The services provided by the library to the scholarly community of icddr,b and outside are circulation and dissemination, Online Public Access Catalogue (OPAC), reprints, photocopying, guidance, reference and bibliographic, internet/online (cyber corner), collaboration and partnership development, inter-library loan, image of book information, current awareness, bulletin information, referral, document request, literature search, citation management, indexing, and training program on literature search, information literacy and reference management (EndNote) services in scholarly writings. The library has its own database, Institutional Repository (IR) where most of published & unpublished materials are available on the website along with other e-resources. icddr,b library identifies, assesses, acquires, processes, preserves and maintains learning resources, and disseminates their availability. The library prepares list of icddr,b publications for the weekly bulletin for the incoming materials and disseminates it in the electronic format to the Centre's researchers and its users.

### 10.1 Dynamic library services

ICDDR,B library is now providing innovative library services to their users. The most notable modern library services are listed below

**Mobile based library Services:** With the ever-growing use of smart phones and tablets, library patrons increasingly expect to be able to access library services and information 24/7 through their smart phones. It provides the users to use the library by installing mobile apps in their mobile. Through the mobile apps users able to search the library resources, can see the loan status, reserve the books, can get email notification, alert by SMS, overdue notices, SDI alerts and Borrower alert messages can be sent to Borrowers' mobile phones as SMS text messages.

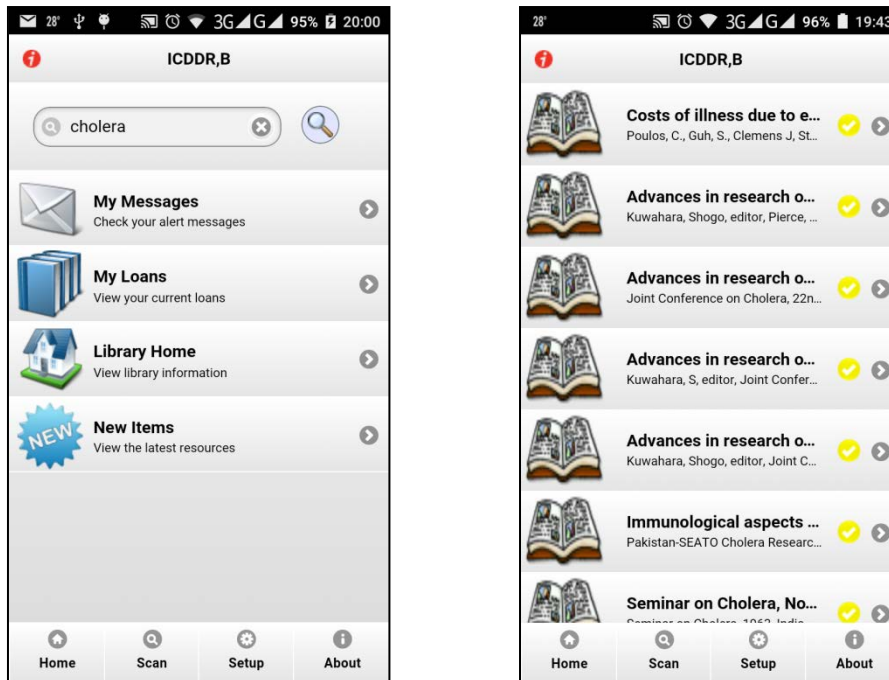


Figure 8: Mobile interface of icddr,b library

**Liberty map services:** Map is the services of this software by which it will provide the location of the book on the specific location of the shelf. Once map's link enabled, OPAC search result will show the shelf location of a copy when users click on classification link. Clicking this link will open a new window to display the map and a blinking marker indicates the general shelf location (Liberty: V5 reference manual build 6, 2015).

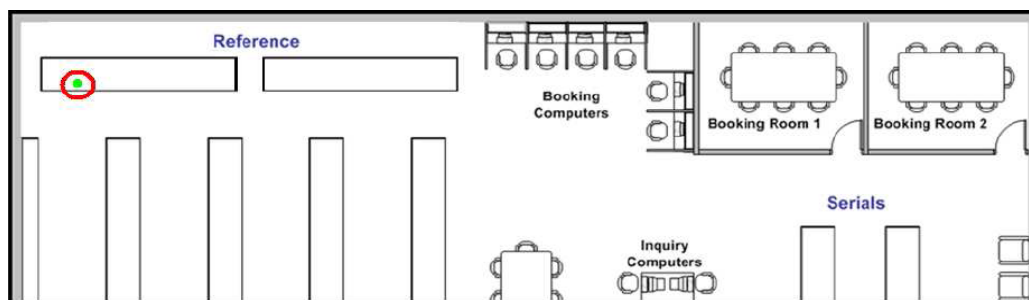


Figure 9: Resource location through Liberty map

**Virtual Reference Services (VRS):** VRS have become one of the key services and gained considerable attention for icddr,b. VRS usually provided to users by E-mail.

**Research Data Services:** icddr,b, provides expert guidance, project consultation, and technical assistance on various aspects of data management and curation.

**Journal Citation Reports:** Journal performance metrics offer a systematic, objective means to critically evaluate the world's leading journals that delivers quantifiable statistical information based on citation data and provides a variety of impact and influence metrics, including the Journal Impact Factor. Icdrr,b library provides the Journal Impact Factor service to scientists using ISI Web of Science database.

**Reference management service:** Reference management in scholarly articles (manuscript) is one of the vital parts to publish research output in any journals. As the management of references is considered as complex part, icddr,b library organizes training programme on EndNote for its researchers to manage references in manuscripts.

**Remote access (MyAthens) to library resources:** MyAthens is an Access Management System developed by Eduserv that simplifies access to the electronic resources of the organization has subscribed to. MyAthens enables researchers to see the set of resources, where researchers are entitled to access from remote area.

**Bibliometric and Scientometric Services :** These services are carried out for studying growth, development and spread of any area of research, citation analysis, find out h index and also for identifying centres of excellence, influential authors etc.

**Information Literacy Services:** icddr,b library organizes various training programs on Information Literacy and Discovery of e-resources.

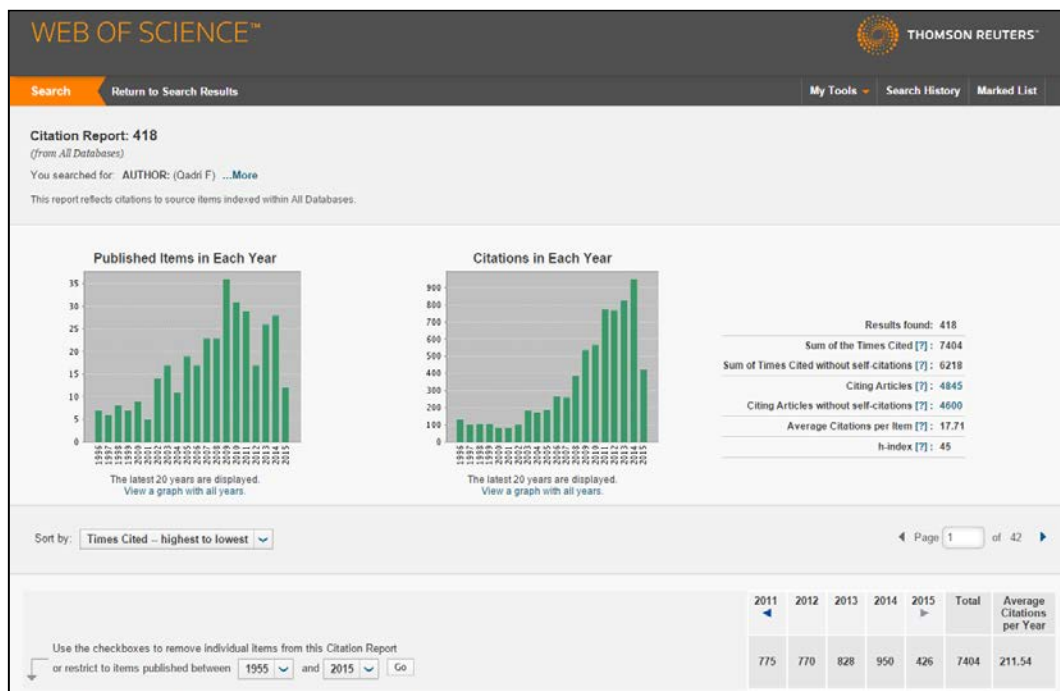
## 12. Quality research measuring & publications tools

**Quality research measuring tools:** The following tools are used for measuring quality research in icddr,b:

- Citation analysis status using ISI Web of Science
- Journal Impact Factor
- h index

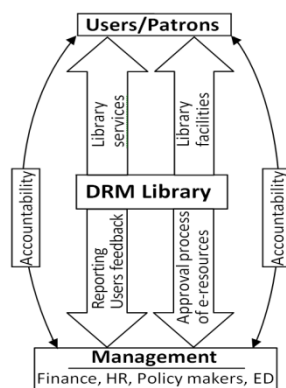
**Quality research publications tools:** At present, there are a lot of fake journals that are published around the world. Before submission of manuscript to any publisher, the following links should be carefully checked for maintaining quality research publications:

1. Beall's List: <http://scholarlyoa.com/publishers/>
2. JournalGuide: <http://www.journalguide.com/>
3. Directory of Open Access Journals: [www.doaj.org](http://www.doaj.org)
4. Open Access Scholarly Publishers Association: [www.oaspa.org](http://www.oaspa.org)
5. ISI Web of Knowledge: Journal Citation Reports
6. National Library of Medicine (NLM), USA, Catalog: Journals referenced in the National Center for Biotechnology Information (NCBI) Databases: <http://www.ncbi.nlm.nih.gov/nlmcatalog/journals>



**Figure 10: Citation report through ISI Web of Science database**

**Usage statistics of e-resources:** Usage reports are usually provided by the publishers, organizations, and corporate bodies. Some publishers and organizations use Counting Online Usage of Networked Electronic Resources (COUNTER) services to provide the usage report to individual organization. Subscribers and registered users usually get the usage statistics/report by year wise, mother wise, and predefined format through their website and email as well.



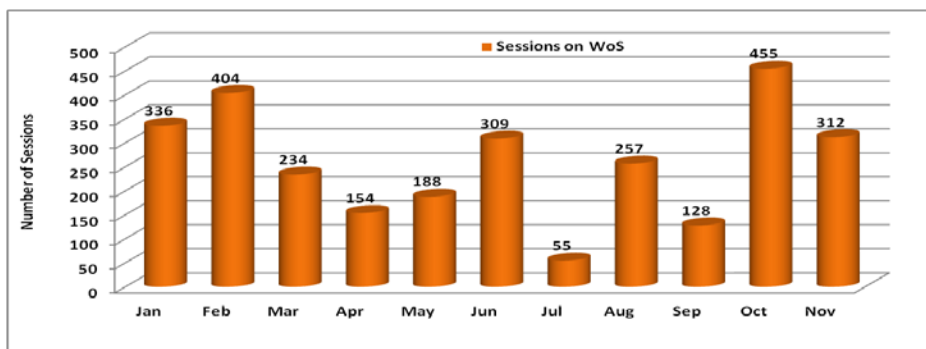
**Figure 11: DRM issues from the perspective of icddr,b library management**

Figure 11 shows the recent overall digital management resources by the icddr,b library. Here, the library personnel are in the middle position performing the vital role for providing library facilities and services to users/patrons and on the other hand reports to the top management of the icddr,b regarding justification, financing, policy making and finally getting approval for e-resources as well. icddr,b library authority has the accountability in order to serve both users and top management in connection to digital resource management process.

**Table 5: Different databases used by the social science and medical researchers [N = 90; Multiple responses]**

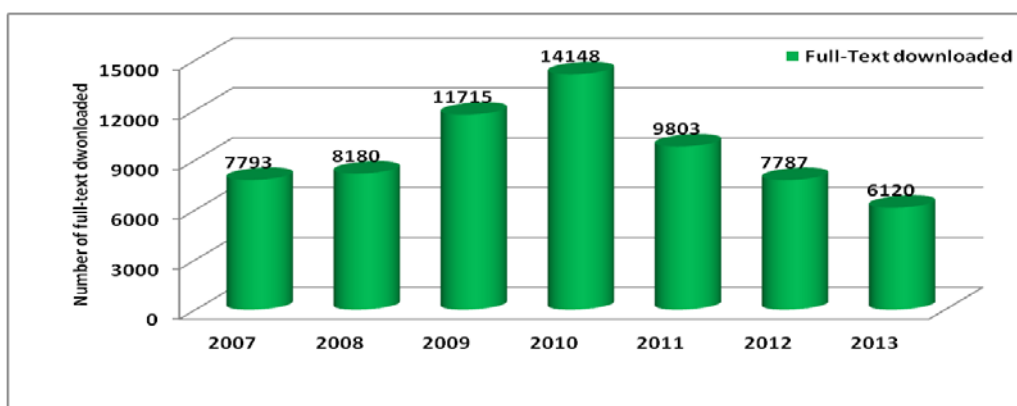
Name of database	Respondent	Percentage
PubMed	86	95.6
HINARI	76	84.4
Science Direct	43	47.8
ISI Web of Knowledge	13	14.4
Ebscohost	6	6.7
ProQuest	8	8.9
SpringerLink	25	27.8
Oxford University Press	27	30
JSTOR	31	34.4
Consortium	4	4.4
BanglaJOL	13	14.4
DOJA	4	4.4
Cochrane Library	16	17.8
JCR	9	10
Impact Factors of Journals	35	38.9
UpToDate	11	12.2
Travex	6	6.7
PLoS Journals	47	52.2
PubMed Central	51	56.7
BioMed Central	48	53.3
Agroa	14	15.6
OARE	6	6.7
Scopus	8	8.8
Ulrich's web	3	3.3
Institutional Repository	12	13.3
Cambridge University Press	22	24.4
Google	75	83.3
Google Scholar	69	76.7

PubMed is the most used database in icddr,b. Table 6 reveals that 95.6% respondents use PubMed, followed by HINARI (84.4%), Google (83.3%), and Google Scholar (76.7%). This study finds that more than half of the respondents (56.7%) use PubMed Central, and BioMed Central (53.3%). PLoS Journals (52.2%), while less than fifty percent of the respondents use Science Direct (47.8%), JSTOR (34.4%), Oxford University Press (30.0%) Springer Link (27.8%), and Cambridge University Press (24.4%). It also reports that less than 20% of the researchers use Cochrane (17.8%) AGORA (15.6%), BanglaJOL (14.4%) and Institutional Repository (13.3%).



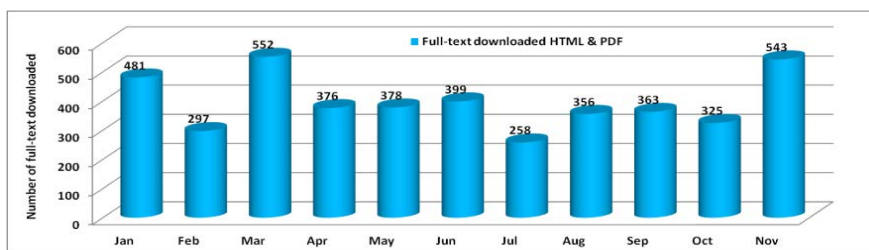
**Figure 12: Total number of sessions on Web of Science (WoS) from Jan to Nov 2014**

The above figure show the month wise total number of sessions connected to web of Science by the icddr,b scientist and library as well through IP address. The data downloaded at the beginning of December 2015. As a result, we got the total number of session from the month Jan to Nov 2014. We observed from the graph that highest sessions attained on the month of October, 2<sup>nd</sup> highest on February, and lowest in the month July 2014.



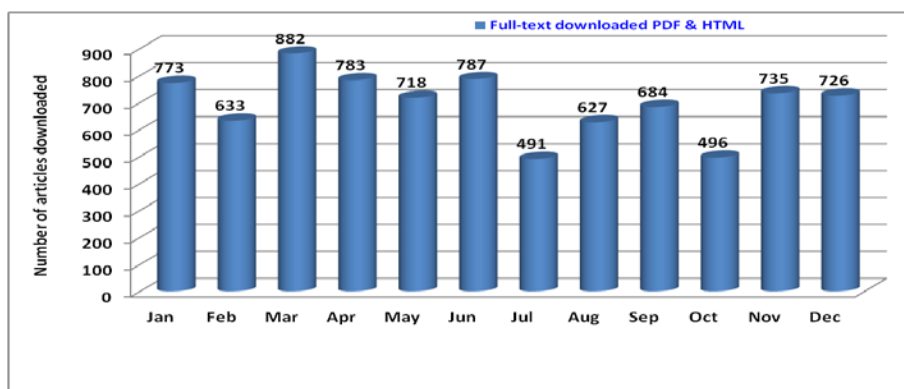
**Figure 13: Number of full-text articles downloaded from HIANRI from 2007 to 2013**

Figure 13 depicts month-wise total number of full text articles downloaded by the researchers/scientists and library professionals form icddr,b. Highest number of full-text articles downloaded in the year of 2010 and the lowest number is in the year of 2013. During the year 2007 to 2013 the total number of full-text articles downloaded by icddr,b is 65,546 from HIANRI.



**Figure 14: Usage report of SpringerLink online resources from Jan to Nov 2014**

Figure 14 shows month-wise full-text articles both pdf and html version downloaded by the icddr,b from January to November 2014 through IP address. In the March it shows highest download, 2<sup>nd</sup> downloaded in November, and lowest in February 2014. In total 4,328 full-text articles downloaded (pdf and html) during Jan to Nov 2014.



**Figure 15: Usage report of Wiley online library resources from Jan to Dec 2014**

Figure 15 shows month wise full-text articles downloaded from January to December 2014. In the figure, it provides highest number full-text articles downloaded in March 2<sup>nd</sup> lowest in January and lowest in July 2014. In total 8,335 number of full-text articles downloaded during the year 2014 from the Wiley Online library.

### 13 Cost recovery management

It is very important for a library to analysis the cost and benefits of resources that are subscribed by the library. Usage statistics are basic and main component which depict the usage of resources and costing as well. In the figures i.e. 12, 13, 14, and 15, we got the usage/downloaded scenario from the icddr,b. From a good number of online resources, we here took usage statistics of only three resources for providing a token of scenario of cost benefit analysis for one year.

### 14 Challenges

Implementing digital projects is a labor intensive activity which requires that library staff to put in extra effort and time. The major challenges are mentioned below:

**Financial Constraints:** Budgetary cuts coupled with inflationary costs of electronic resources have hindered the library from acquiring more electronic resources.

**Bandwidth:** Bandwidth is a major challenge to access to the electronic resources. The slow connectivity frustrates researchers and students who would like to access the electronic resources.

**Copyright:** Copyright is a complex issue that strongly impacts the selection of materials for digitization.

**Advanced Technical Skills:** The staff members in the library need to be trained with latest technology for implantation of digital library concept which is playing around in the new Information environment.

**New Learning:** There is a lack of training programs for library staff members in order to obtain more advanced knowledge on digital resource management system.

**Leadership Skills:** Lack of leadership skills and sound knowledge regarding digital library management system of library professionals in Bangladesh.

**Attitude of Top Management:** In most cases, the top or higher management of an organization shows reluctant attitudes in terms of allocating proper budget for implementing ICT facilities in library and to overcome this challenge librarian should convince the higher management in a justifiable manner.

### 15 Transforming for Future

It will require upgrading existing library management systems, services, environment, infrastructure, and empowering the skills and competencies of library staff members in the digital and web-based environment. The following are some of the specific examples where attention will be required:

- Improve existing library facilities and services.
- Introduce self-photocopy services system
- Introduce Z39.50 to liberty software
- Become a member of UGC Digital Library (UDL)
- Provision for using cloud computing systems (high availability of server and system)
- Database is being under constructed for providing scientific literature analysis services
- Organize library Internet and Intranet pages in better environment
- Auto identification of member ID card, faster services, reduces queuing time, and management of library space.
- Library blog, IM, RSS feed, podcast, and standard searching facilities.
- Able to cope with new technology

## 16 Conclusion

There are many changes taking place in the field of library management and information services globally. These changes include accelerated growth of new knowledge, new technology, and shifts in the provision of library and information services. Printed reading materials are now in digital format available on the internet. Way of acquisition and sources of reading materials are changed. To meet the need of our researchers with this technological change, Library and Information Services Section (LISS) requires coping with all sort of new technologies and online platform of scholarly reading materials to upgrade the library services. icddr,b library should take future initiatives in order to revamp the existing library and its infrastructure and services keeping the future technological development in mind such that the new library is backed by a vision and strategies and equipped with plans to be dynamic in its operation to cope with the emerging changes to fulfill the needs of its users within and outside icddr,b.

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# NUB Libraries: progress in digitization

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**Abstract:** This paper aims to explore ways of using digital technology in Northern University Bangladesh, Library and Information Department. In meeting challenges of digitization, NUB Libraries hope to share new developments and work with other national and international libraries.

**Keywords:** Digital; Automated, Digital Repository, Digital Library, Online Storage, Bangladesh

## 1. Introduction

Digital revolution of information developed since the 1990s through the electronic magic of the Internet. As a result digitized materials of an institution, project outcomes, research output, history of a nation and literary collection have become quickly available. Anyone can search and locate digital collections from any place where there is a computer access.

### University Profile:

Founded in 2002

6,638 current students

185 current faculty members

8, 595 Bachelor Degrees provided

8,583 Master's Degrees provided

### Library Profile:

Over 97,413 books of 5506 titles

Library resources are systematically arranged by the Dewey Decimal Classification Scheme.

The library collection is enriched with various information resources on business, management, marketing, finance, economics, computer science and engineering, electrical and electronic engineering, electronic and communication engineering, textile engineering, English language and literature, sociology, pharmacy, public health, law etc.

E – Journals: More than 25,793 full text e-journals through Research4life, eLibraryUSA and other open access databases

E - Books: More than 30,000 full text e-books through Research4life, LibraryUSA and other open access digital libraries.

Printed resources: Over 97,413 books of 5506 titles, 534 audio visual materials, 4,500 theses and project reports among which 1,553 are Master's theses, 927 printed journals.

This paper describes what the Northern University Bangladesh, Library and Information Department (NUBLID), is doing and thinking about providing better access to all its scholarly materials.

The article is organized as follows. The history of library digitization is discussed first. Then initiatives of NUB libraries are described. Some challenges in NUBL digitization are conferred in the next section. Finally, based on the previous sections, a conclusion is drawn.

## 2. Library digitization in Bangladesh

Many terms describe the use of advanced technology for library collection management: 'Computerized Library', 'Electronic Library', 'Virtual Library', 'Automated Library', 'Digital Library', 'Cloud Library', 'Literary Collection in Disk', 'CD based Journal Index', 'Online Databases', 'Digital collection, Bibliographic Databases on CD ROMS; 'Institutional Repository', 'Digital Bibliography', 'Online Catalogue' and so on.

From the very early ages and all over the world librarians have been initiating various methods and technologies for organizing knowledge. They applied various techniques for safely preserving knowledge and found new ways for retrieving and accessing existing knowledge.

In this context we recall Melville Dewey and the Dewey Decimal Classification (DDC) System. Using this and similar classifications anyone can search and locate his/her desired book in any library collection. All what is needed to find required information is knowing the DDC arrangement. In case of digital storage/collection management, uniformity to preserve, access and use of digital data helpful for end-users in easily retrieving literature from various types of digital collections. In these days

of advanced technologies librarians continue experimenting to develop better digital tools for *storage media, refreshing digital data, data migration, technical emulation, digital archaeology*. They take care of basic data security and in formatting metadata which helps to manage and retrieve digital data in a consistent way. For example, *Project Gutenberg* can be mentioned as the first information provider on the Internet and as the oldest digital library with the largest single collection of free electronic books, or e-books. 'ibiblio' of University of North Carolina, (formerly known as Sunsite or Metalab) is the oldest digital institutional repository (Thomas J, 2007).

Also in Bangladesh librarians are well aware of new developments. Computerization of libraries started in Bangladesh with the introduction of InMagic software in 1987 by the library of the International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDRDB) (Chowdhury MMH and Khan MSI, 2013).

Bibliographic databases on CD ROM like MEDLINE, POPLINE, the JSTOR CD ROM and the AgriIndex CD-ROM were in the nineties replaced by Internet accessible digital libraries or databases like PubMed, JSTOR or HINARI. This led to greater satisfaction by library patrons.

The twentieth century gave way to Open Access Online Databases like PubMed and HINARI, but also to Online Databases for which a subscription is necessary such as EbscoHost, IEEE, ProQuest. Another developments include institutional repositories of academic and research organizations like dspace.icddrb; Open Access Bangladeshi Journal Publishing Platform BanglaJOL and many more.

### **3. NUBL digital initiatives**

#### ***3.1 Digitization of services***

Since 2011 the NUB Digital Library Services is managed with the Open Source Integrated Library System Software *koha*. It is enriched with various modules including 'Web based library database search', 'Navigation from distant work-stations', 'Book reservation and renewal through user interface of Library Web', 'Login facility to know status of patrons on their own', 'Auto email alert services' etc.. The first eight years of its establishment (in 2002) the library was managed manually. The young library team worked as fosterers in implementing advanced technologies in NUB Libraries. They submitted proposals to the NUB authority and worked hard to convince them to spend a small budget for Library automation and digitization. They invited a local expert group for installation and customization of the open source software *koha*. This group installed *koha* 3.02.06 for NUB LID and provided training to NUB personnel on different modules. The MARC21 training was very effective for the NUB team to create polished data and to upload in *koha*. NUB team is continuing MARC record preparation in a way proper for the *koha* database. Unfortunately, the expert group did not show how to keep the software updated. When invited again they charged exorbitant fees which was too high for NUB.

#### ***3.2 Digital Institutional Repository***

The Digital Institutional Repository of NUB is managed with DSpace, an Open Source Software. This repository is enriched with textbooks, publications of NUB Scholars, journal articles published by NUB, and other useful materials. In 2012, we planned to build the NUB digital repository. Primarily we motivated scholars to deposit grey literature items such as newsletters, annual reports, magazines, books, journals, working papers and theses published by members of NUB. In the next year, the Bangladesh Association of Librarians, Information Scientists and Documentalists (BALID) extended its volunteer professional service to NUB for installation, customization and configuration of DSpace on Debian, Ubuntu.

#### ***3.3 E-books***

It is not always possible for a university library to acquire 200 copies of a text book for 200 students of a class at a time. How to find a solution for this demand? I have asked myself several times how to improve the library's service in this respect. Do students have their own laptops or PCs? Do we have sufficient computer labs? Do we have minimum speed internet connections? Do we have Wi-Fi connection everywhere on campus? If answers of all the questions are yes, then why we are not bringing the textbooks together in a Digital Storage? Handling this situation was another motivation of DSpace installation. In settling 'Access Restrictions' copyrighted materials and providing 'Open Access' or 'Access on Request' DSpace is very user-friendly.

### ***3.4 Online Academic Bibliography***

From the time I worked at icddr,b (International Centre for Diarrhoeal Diseases Research, Bangladesh) my interest in scientometrics has grown. Scientometrics is an attractive method to see the movements of a research output in intellectual space! One can speculate with scientometrics, how it is sparkling the paths and enlighten the paths in time windows, in places, fields, persons! The Doctoral dissertation of *Mahbuba D* can be referred to know about international Bangladeshi publications and their growth, international collaborations of Bangladeshi researchers, fields of research interest of Bangladesh in different time windows.

To do scientometrics research one needs data such as those collected in citation indices. Then one can obtain information such as: how many articles an author has published, how many articles received citations and how many did they receive, who collaborates with whom, etc. *Online Academic Bibliography* can play a vital role as a database for scientometrics research by counting number of articles a faculty member published in years. This perspective is the third motivation to build a digital storage of scholarly publication.

### ***3.5 Academic Journal Online***

Thomson Reuters' Web of Science is the established and standard citation index to perform these studies, but unfortunately subscription costs are very high. Research and academic organizations in developing countries cannot afford them. Scopus is similarly highly priced and is less complete when going back in time. Google Scholar is free but its exact coverage is unknown. Moreover, it contains duplications, non-published draft papers etc. Moreover all these scientometric databases are biased by their preference for English content. To reduce the English language bias national level initiatives are needed such as the Chinese Citation Index, the KCI Korean Journal database and Scielo (in Latin America) which cover non-English journal articles. Ideally these databases should be integrated and searchable within Web of Science. INASP brings hope for developing countries like Bangladesh by its JOL projects. Unfortunately very few Bangladeshi organizations came forward to join this project. Mahbuba D of NUB LID team has taken the initiative to join Banglajol with its peer-reviewed journals published by Faculty of Business and Faculty of Law. If a large number of quality journals comes forward and joins BanglaJOL, we can set our hope that once BanglaJOL will be integrated and searchable within the Web of Science.

### ***3.6 Access to databases of e-journals and e-books***

NUB Library website have been augmented with useful links like JSTOR, Research4life (HINARI, AGORA, OARE, ARDI), Regional Journals Online etc. Through these online databases library patrons have access to thousands of free full text e-resources i.e. articles, book chapters, books etc.

NUB has four faculty libraries in Dhaka, one in Khulna and another one in Rajshahi. All libraries are connected by intranet. Wi-Fi connections in each faculty library help patrons to access these online resources easily.

## **4 Challenges**

Creating a digital environment in six faculty libraries of NUB with almost 98000 books of six thousand titles was not an easy thing to do. It was challenging to start providing digital services to more than six thousand students and about two hundred teachers. LID team and some internees from University of Dhaka worked very hard for three months. The Open Access Public Catalogue (OPAC) was formally launched on 11 December 2011.

### ***4.1 Technical support***

Building the institutional repository had a high priority at NUB. Due to insufficient technical support from the IT Department, it took to 2013 and needed the effort of Kazi Farhad Noman of BALID. The LID Team, however, is working hard to enrich the collection on a regular basis.

## 4.2 E-resources management

I will only discuss one step in the digitization process, namely *Scanning to pdf*. When resources are not born-digital we need to transfer printed resources in to digital resources. One must need to know how to clean a scanned jpg by a tool such as Photoshop; how to convert JPG in PDF, how to file and name a chapter of a book or an article of a journal by *Acrobat reader 6.0*; how to compress pdf to control up-loadable or downloadable size. To be digitized with the full process a 100 paged book requires five to six days with full dedicated working hours of LID personnel. This is time consuming work. Kunny and Cleveland perfectly said, “Librarians may discover that “libraries-without-walls” are actually only libraries with new walls—technologically bounded, legally restricted, and administratively hamstrung.”

## 5. Conclusion

Digitization in Bangladesh is still at a young age. Librarians should take the time to think together, work together and go jointly on the way to further digitization. Indeed, if a library has digitized a printed book there is no need for other libraries to do the same work all over again. Together all libraries in the country can move much faster than each on its own. A good number of libraries have already created institutional repositories and digital libraries. We hope that soon librarians take the initiative to establish an Open Network of Digital Libraries at national level so that all digital libraries in Bangladesh can be networked in a common platform.

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# Developing CIRDAP Institutional Repository for CIRDAP Member Countries

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**Summary:** CIRDAP is developing Institutional Repository, which will connect CIRDAP Member Countries (CMCs), through sharing resources, knowledge & information on integrated rural development and poverty alleviation programmes. The Institutional repository will help all CIRDAP member countries to access knowledge on integrated rural development and poverty alleviation stored on online platform that will benefit people of CIRDAP Member countries leading them towards sustainable rural development.

## 1 About CIRDAP

The Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) is a regional, intergovernmental and autonomous organization. It was established on 6 July 1979 at the initiative of the countries of the Asia Pacific region and the Food and Agriculture Organization (FAO) of the United Nations with support from several other UN bodies and donors. The Centre came into being to meet the felt needs of the developing countries at that time as an institution for promoting integrated rural development in the region. From the original six members, CIRDAP has now grown up as a Centre of 15 member countries. The member countries are Afghanistan, Bangladesh (Host State), Fiji, India, Indonesia, Iran, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam.

The main objectives of the Centre are to: (i) assist national action, (ii) promote regional cooperation, and (iii) act as a servicing institution for its member countries for promotion of integrated rural development through research, action research/pilot projects, training and information dissemination. Amelioration of rural poverty in the Asia Pacific Region has been the prime concern of CIRDAP. The programme priorities of CIRDAP are set under four areas of concern: (1) agrarian development; (2) institutional/infrastructure development; (3) resource development including human resources; and (4) employment. Operating through designated contact ministries and link institutions in member countries, CIRDAP promotes regional cooperation. It plays a supplementary and reinforcing role in supporting and furthering the effectiveness of integrated rural development programmes in Asia and the Pacific region.

### 1.1 Aziz-ul Haq Library

- ❖ CIRDAP's Aziz-ul Haq Library, one of the finest special libraries in the country, was established in 1980. The library was named after Aziz-ul Haq; founder Director of CIRDAP.
- ❖ Aziz-ul Haq library is a resourceful library with a collection of 20,000+ books. It receives about 230 Journals through exchange, subscription and complementary. Books, journals, brochures, programme literature, reports of research studies, technical notes and series, proceedings of conferences, seminars and workshops are constantly added to the library's resources. Library also receives CD-ROMs on a regular basis like World Development Report, World Development Indicators etc.

## 2. D-Space and Institutional Repository:

D-Space is open-source library management software used for developing open digital repositories. It is free and easy to maintain since it can be customized to fit the requirements of any organization. It saves space and enables easy and open access to all types of digital content including text, images and data sets.

An institutional repository is an online archive for collecting, preserving, and disseminating digital copies of documents and publications of an institution. Some key objectives of institutional repository are to provide open

access to institutional research output by self-archiving it, to create global visibility for an institution's scholarly research, reports and publications or any documents in digital format.

## **2.1 Why DSpace?**

- ❖ Getting research results out quickly, to a worldwide audience
- ❖ Reaching a worldwide audience through exposure to search engines such as Google
- ❖ Storing reusable teaching materials that you can use with course management systems
- ❖ Archiving and distributing material you would currently put on personal website
- ❖ Showcasing students' theses (again with permission)
- ❖ Keeping track of own publications/bibliography
- ❖ Having a persistent network identifier for work, that never changes or breaks
- ❖ No more page charges for images.

## **3. Purpose of the Project**

CIRDAP Digital Institutional Repository will help to bring together all information resources in a digital format with open access for CIRDAP Member Countries as well as other stakeholders worldwide including researchers, students, institutions, organizations, NGO's, private sector, International NGO's and development partners who are working for rural development and poverty alleviation.

Given the feasibility and simplicity of the Repository, people can access the available information easily and timely. Scholars of different communities in CIRDAP Member countries can get wider access to knowledge on rural development and poverty reduction strategies. It will save time and offer vast information related with rural development issues like agriculture, farming, health, economic development, education, women empowerment and so on. Moreover, this model can be replicated in other libraries offering benefit to people in their respective areas.

It is expected that the project will have impact on the lives of rural people connecting them with digital information and knowledge resources via the Institutional Repository. Digital Institutional Repository will bring many benefits to rural communities by empowering them with knowledge and information thus improving their socioeconomic conditions.

### **3.1 Objectives of the Project**

- To archive and digitize the old and important CIRDAP publications for future use, as the paper documents are disintegrating, for example CIRDAP Study series.
- To provide access, and prompt and efficient services to rural development experts, students, researchers of CIRDAP Member Countries (CMC's), International Non Governmental Organizations (INGO), NGO (Non Governmental Organizations), Micro finance Institutions, Private sector working for advancement of integrated rural development and poverty reductions around the world.
- To accelerate regional and international cooperation and communication among organizations and Institutions engaged with rural development, and poverty alleviation.
- To serve as a clearing house and data bank for information on Integrated Rural Development and Poverty Alleviation in Bangladesh as well as other CIRDAP Member Countries.
- To ensure easy flow of information in different communities so that even the small farmers, disadvantaged and marginalized people, irrespective of social class and condition, can access information on agriculture, farming, livestock, microcredit, handicrafts, entrepreneurship and so on.

### **3.2 Key Activities of the Project**

- Developing storage system and website with the D-space Software.
- Digitization of CIRDAP publications and archiving documents on the database which will serve as a Data Bank for information and knowledge on rural development in CMC's and other countries of the world.

- Generation and maintenance of resources to reach maximum number of the beneficiaries in the long run.
- Arrangement of training and workshop to promote and assist in replication of the software in other institutions in the region.

### ***3.3 Impact of the project***

CIRDAP brings out several publications related to rural development and poverty alleviation; and disseminate information resources in CIRDAP Member Countries.

The repository will serve as a clearing house and data bank for information on rural development and poverty alleviation in the region.

As the services will be free of cost, it will ensure easy flow of information in different communities even the excluded and marginalized people.

It will accelerate regional and international cooperation and communication among organizations and Institutions engaged with rural development, and poverty alleviation.

Being a hub for vast information resources on different issue, the repository will promote knowledge and information generation by assisting development experts, students, researchers, International Non Governmental Organizations (INGO), Micro Finance Institutions working for advancement of rural development and poverty reductions around the world.

It will help to set up rural community linkages, structural transformation of human resources development interventions to enhance capacity building of the poor through knowledge sharing.

This will be the platform for sharing of knowledge of rural people in CMC's as well as the international community engaged on Rural Development and Poverty Alleviation.

Building connection, the repository will coordinate access to knowledge generation and dissemination, exchange of ideas and best practices on rural development and poverty alleviation processes among the CIRDAP member countries.

Digitization will preserve rare publications and documents for future use. Since the storage will be online, it can be accessed by researchers, students and experts from anyplace around the clock.

The repository will also share success stories and best practices of rural development initiatives which are implemented in different countries can help other countries of the world to replicate and improve.

Knowledge and Resources can be shared through training programmes to the marginalized and vulnerable groups, other disadvantaged communities who live in rural remote areas.

Enabling knowledge network for information sharing can contribute to timely information to national and international users which are immediately necessary for approaching challenges for rural development.

## **4 Conclusion**

Since information and knowledge is the core part of the rural development, CIRDAP has always given priorities in knowledge generation and dissemination. In continuation of its different initiatives, this project will help to sharing and dissemination of resources offering opportunity to worldwide community who are engaged on rural development and poverty alleviation.

Storing the resources in CIRDAP Institutional Repository not only store information in a systematic manner but also enhances CIRDAP's publications approachable by everyone, especially who are working in the field of rural development and poverty alleviation.

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# RECOMMENDATIONS

## Plenary Session

A national seminar on above mentioned topic was held on 22 August 2015 at the International Conference Centre (CICC) of Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP), Dhaka, Bangladesh. The programme was organized by Bangladesh Association of Librarians, Information Scientists and Documentalists (BALID) with the participation of around 180 library and information professionals from around 110 organizations. The opening ceremony of the seminar was started at 9:00 am and presided over by Dr. Mirza Mohammad Rezaul Islam, Chairman of BALID, and Librarian, Islamic University of Technology, Bangladesh. Mr. Imran Ahmed, Honorable Member of Parliament & Member of Standing Committee, Post Telecommunication and Information Technology, Bangladesh National Parliament and Begum Akhtar Jahan, Honorable Member of Parliament & Member of Standing Committee of Ministry of Finance, Bangladesh National Parliament were present as Chief Guest and Special Guest respectively. Dr. Md. Nazimuddin, Manager, Library and Information Service Unit, icddr'b was present on the Dias as Seminar Convener. The session was begun with the welcome speech of Mr. Sasanka Kumar Singha, Secretary General, BALID. Subsequently other guests and keynote speakers made their speeches and the comments are as follows:

### Opening and Keynote session remarks/comments:

**Keynote paper 1:** Dr. Md. Mostafizur Rahman, University Librarian, North South University (NSU) Library presented the Keynote on “Cross-Talk of Digital Resources Management: step towards digital Bangladesh”. Following key points have been summarized as the findings from the presentation of Dr. Mostafiz are:

- No specific software is completely adoptable though customization shall fulfill the requirement of facility and services
- Resource Description and Access (RDA) is the most usable metadata framework
- In case of implementation of digitized systems, authentically developed resources are only considered as the source material.
- Integrated user and browsing interface are also very important for digital resource management.
- Policy and Procedures of Digitization are highly recommended.
- Difficulties related to digital resource management are discussed.

**Keynote paper 2:** Ms Hazera Rahman, Deputy Librarian, Southeast University (SEU) Bangladesh presented the second keynote paper on Community Library O Milon Kendro (Community Library and Assembly Centre - কমিউনিটি লাইব্রেরী ও মিলন কেন্দ্র). Following focus points have been summarized from the presented paper:

- Community development according to identified requirement of local population to keep pace with globalization.
- Information literacy / support to gradually maximize their standard of living.
- Planning according to different phases: existing infrastructure; plan for sustainability; and long-term plan.
- One-stop service point for local population.
- Under-privileged population of rural Bangladesh will have access to information resources and services to support their daily life and livelihood
- Relevant Government Office / Ministry to mentor the project including with community representative/s
- Facilities and service-oriented social businesses will create jobs and entrepreneurship opportunities for local people within the community which will boost socio-economic conditions

### Speech of Special Guest Begum Akhtar Jahan, MP:

- Once the neglected library profession is now going ahead with the participation and involvement of young library professional.
- Dr. S R Ranganathan's 5 Laws of Library Science is very relevant to digital Bangladesh to provide right information, to right person in right time. Only digitization and providing access to them can ensure such principles.
- Sheikh Hasina, Honorable Prime Minister, Peoples' Republic of Bangladesh has declared Digital Bangladesh in 2008 but that time the concept was much unknown. Now we see everywhere about the result of usages and application of ICT. Librarian can fully implement the dream of Digital Bangladesh.
- She urged to come up the library professional to materialize the dream of Digital Bangladesh.

- The digitization programme should be extended up to Union Parishad level.
- She also urged to deliver the outcome and recommendation of the seminar to Honorable Prime Minister.

#### **Speech of Chief Guest Mr. Imran Ahmed, MP**

- The concept of community library addressed in the key note paper is a down to earth idea with the focus on local community development through the support services and facilities. This would not be difficult to implement with proper initiative.
- The role of librarian is very essential to lead the development activities of Bangladesh.
- Application of digitization can ensure preservation of and safe access to old and rare books.
- Role of librarian is significant as teacher in regard to providing required information to learners.
- Librarian can expand the scope and field of works through the involvement and collaboration with different organizations which do focus on not only books but automated information and digital resources.
- He also expressed his expectation that library professionals' active contribution to ensure digital Bangladesh.

#### **Speech of Chair Dr. Mirza Mohammad Rezaul Islam, Chairman, BALID**

- Brief introduction to BALID as a professional body.
- Brief outline of BALID activities for professional development.
- An appeal for 10 kathas of land from Purbachal or any other government projects with government rated price has been placed for consideration to build BALID's infrastructural facilities which would lead to enhance professional competency and other facilities.

#### **Vote of thanks by Dr. M. Nazimuddin, Convener, National Seminar**

- Thanks to Chief Guest and Special Guest for sharing time from their very demanding schedule to attend the Seminar.
- Thanks to all guests and participants to grace the program.
- Thanks to all paper presenters for their hard work for preparing and presenting relevant papers.
- Special thanks to CIRDAP administration for supporting with the facilities and services.

After the opening ceremony and refreshment break, the main session divided in four Technical Sessions of the National Seminar started respectively.

#### **Technical Session – 1: Digitization in Libraries**

**Session Chair:** Mr. Ashish Kumar Sarker, Director General (Additional Secretary), Department of Public Library, Ministry of Cultural Affairs, Peoples Republic of Bangladesh

**Paper-1:** North South University Library Management System: Experiences of customization in library automation and digitization **presented by** Dr. Mostafizur Rahman, University Librarian, NSU

**Paper-2:** Steps towards digital Bangladesh: Bangladesh Bank library perspectives **presented by** Tasnim Fatema, Deputy General Manager, Bangladesh bank

**Paper-3:** Model community library O Milon Kendro **presented by** Hazera Rahman, Deputy Librarian, SEU, Bangladesh

#### **Technical Session – 2: Open Source Software in Libraries**

**Session Chair:** Prof. Dr. M. Kaykobad, Dept. of Computer Science and Engineering, Bangladesh University of Engineering and Technology (BUET)

**Paper-1:** Koha: an open source integrated library system **presented by** Dr. Md. Zahid Hossain Shoeb, Deputy Librarian, Independent University Bangladesh (IUB)

**Paper-2:** DSpace: an open source repository software presented by Kazi Farhad Noman, Assistant Librarian, Southeast University Bangladesh

**Paper-3:** Greenstone: an open source digital library software **presented by** Md. Ahasan Habib, Library Officer, Islamic University of Technology, Bangladesh (IUT)

**Paper-4:** Senayan Library Management System (SLiMS): an open source library **presented by** management system A.K.M. Nurul Alam, Assistant Director, Bangladesh Bank

**Publisher's presentation:** Presentation of Elsevier, a world-leading publisher of scientific, technical and medical information products and services **presented by** ELSEVIER participant.

### **Technical Session – 3: Use of ICTs in Libraries**

**Session Chair:** Prof. Dr. Md. Nasiruddin, Chairman, Dept. of Information Science and Library Management, National University Bangladesh

**Paper-1:** ICT use in the Library of Independent University, Bangladesh: past, present and future **presented by** Muhammad Hossam Haider Chowdhury, Librarian, Independent University, Bangladesh (IUB).

**Paper-2:** Automation of resource management in BUET central library: procedure of implementation of integrated library management system **presented by** Shah Abdul Kabej, Deputy Librarian, Bangladesh University of Engineering and Technology (BUET)

#### **Session chair recommendation/comments**

Dr. Md. Nasiruddin advised BALID to patronize one standard software/ automation system which may be suitable for all libraries and initiate necessary training to make that popular. All types of training, workshop, support services should be integrated and delivered based on the unique platform.

He also expressed his appreciation for addressing the modern community library concept and delivering the key note paper with the significance of community support irrespectively towards sustainable development.

### **Technical Session – 4: Web-based service and digitization**

**Session Chair:** Mr. Minhaj Uddin Ahmed, Director, Centre for Information Studies, Bangladesh (CIS,B)

**Paper-1:** Discovery to Delivery: web-based library services of ICDDR,B **presented by** Dr. Md. Nazim Uddin, Senior Manager, Library and Information Service (LIS) Unit, icddr'b and Md. Shafiu Rahman, Information Officer, LIS Unit, icddr'b

**Paper-2:** Libraries of Northern University Bangladesh: Progress in digitizing **presented by** Dr. Dilruba Mahbuba, Deputy Director & In-charge, Library and Information Department (LID), Northern University (NUB), Bangladesh.

**Paper-3:** Developing CIRDAP Institutional Repository for member countries **presented by** Dr. Usha Rani Boruah, Librarian, Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP), Dhaka, Bangladesh

### **Plenary Session**

**Session Chair:** Dr. Mirza Mohd Rezaul Islam, Chairman, BALID and BIIM

#### ***Discussants:***

**Mr. Shyama Prasad Bepari**, Joint Secretary, Ministry of Education, Peoples Republic of Bangladesh

- Librarian should take responsibility to make digital Bangladesh.
- BALID should initiate training for library professional to make them capable of out sourcing services that would impact on increasing scope and income of library professionals.
- Emphasized to extend library service centres up to Union Parishad Public Library and school library.
- BALID should set up training hub to conduct and coordinate professional training.
- This seminar covers and describes different software which are being used various libraries in Bangladesh. Another seminar should be organize on “Why and how ICT/digitization adopted in various libraries” covering finding and discussion of ICT using libraries. The seminar should be research based.

**Mr. David Hilton**, Program Officer (OIC on date), CIRDAP Bangladesh

- Library should be incorporate with ICT division of Bangladesh Government
- Expect cooperation from BALID to make knowledge-based connection with other member countries of CIRDAP.

**Prof. Dr. Abdus Sattar**, Controller of Examinations, University of Information Technology & Sciences (UITS)

- Advised to form digitization consortium of Bangladesh to ensure uniformity of resource digitization.
- Librarian and information professional should involve themselves to information super highway.

### **Post-discussion Question & Answer Session**

**Question by Dr. Md. Anwarul Islam, Librarian, Sher-e- Bangla Agricultural University:** There are different library management software which are used in different libraries. BALID is also organizing training for various software in different times. As a result many library professionals do not fully know which software may be suitable for them. Should we recommend any standard software suitable for our country?

**Answer by Dr. M. Nazimuddin, Seminar Convener:** There are differences in mission and vision in various organizations. Besides, there are also differences in infrastructural facilities which have impact on software selection and implementation. So the software should be selected as per organization's mission, vision and infrastructural facilities.

**Remark by Dr. Golam Mostafa, Deputy Librarian, University of Rajshahi:** Which software we use is not main factor but database where we preserve data is important. If we have data, we can easily migrate the data from one software platform to another suitable platform.

**Responded by Dr. M. Nazimuddin:** Thanks for your observation. If you have more suggestions, please send us and we will incorporate them if possible.

**Question by Md. Abdul Khaleque Sarker, Deputy Librarian, Stamford University, Bangladesh:** We have to depend on IT personal for installing software in library. How we can easily install software or which software librarians can install and use by themselves.

**Answer- Dr. M. Nazimuddin:** BALID very often organize training and workshop on various software which covers software basic to technical issues. Dr. Nazim advised interested professionals to take part in such types of trainings and keep contact with the ICT Wing of BALID.

Recommendations from the Seminar session discussion:

1. Open source digital resource management software may be customized according to requirement.
2. Reliability of authentically developed systems is strongly recommended.
3. Browsing and user interface to be integrated.
4. Formulation of policy and procedures for digitization are highly recommended.
5. Information literacy of local community to be ensured to maximize living standard in rural /remote areas of Bangladesh which will support community development.
6. Pilot projects may be taken for community development with the initiative of Government of Bangladesh, NGOs and local administration by updating existing facilities; plan for sustainable and long-term facility; multidimensional facilities by encouraging local population towards entrepreneurship.
7. Community facilities and service-oriented social businesses are recommended for sustainable community development. BALID may contribute to the entire process by providing training and support to set up the centres.
8. With the implementation and application of ICT, Library and Information professionals are highly praised and recommended for contributing Digital Bangladesh.

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