The Eastern Librarian, Volume 25 (2), 2020, ISSN: 1021-3643 (Print). Pages: 25-46
Available Online: http://www.lab.org.bd/journal

INTEGRATED LIBRARY MANAGEMENT SYSTEM: AN EVALUATION BY A HOLISTIC SURVEY IN BANGLADESH

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Abstract

An Integrated Library Management System (ILMS) is also considered as a Library Management System (LMS), which is an enterprise of the resource planning system for a library. Today the technological advancement has brought substantial changes in almost every aspect of our lives. This has also a direct impact on LMS. Information and communication technology has made the users comfortable and friendly to use library resources. ILMS is now a focal point in today's library science to promote the activities in a library. The most popular open-source like Koha and Dspace are highly involved in ILMS. This paper underlines the ILMS in Bangladesh with a holistic evaluation of prospects and challenges in the future days to come.

Keywords

Library Management System (LMS), Library Automation, Integrated Library Management System (ILMS)**,** Digital Bangladesh, Database, Online Public Access Catalogue (OPAC), Vision 2030.

Introduction

The traditional role of academic libraries is to gather, process, spread, store and use data to offer support to the college/school network. Nevertheless, nature in which academic libraries work today is evolving. The accomplishment of such libraries relies upon their capacity to use data and information on its staff to serve readily the requirements of the scholastic workforce. Library computerization implies the use of machines to perform distinctive routine exercises, for example, dull and

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administrative occupations associated with the capacities and administrations of the libraries. It is concerned with overseeing, controlling and computerizing library assortments, exercises, and administrations. In a computerized library, PCs are utilized in the greater part of the exercises, for example, securing, listing, dissemination control, and periodical administration. Library computerization not only exclusively performs housekeeping exercises; yet in addition gives the current and significant data to the client, as per their requests.

An "integrated'' library system (ILS) is an automated system, as depicted above, in which all the useful modules share a typical bibliographic database. ILS is genuinely a venture where assets are arranged in framework for a library. ILMS is utilized to finish process robotization in libraries that not just handles standard acquisition undertakings, for example, following things possessed, orders set, solicitations paid; yet additionally permits looking through bibliographic records, oversees flow and a large group of other client confronting administrations.

Objectives

Information technology has brought drastic and dramatic changes in the functioning of the libraries and rendering services to the users. The study highlights the in-depth study, prospects and challenges of Bangladesh in the quest of LMS. The objectives of the study are:

a. To unearth the evolution of ILMS ;
b. To elucidate the development of the ILS software, an overview of LMS, technology, and techniques for implementing ILMS ;
c. To focus on present scenario and identify the prospects of ILMS in Bangladesh;
d. To find out the challenges of ILMS in Bangladesh.

Literature Review

There is not much research literature on the subject to date. After more than a decade of library automation development and implementation, starting in the late 1990s, libraries have been facing the challenges. It was ushered in by rapidly evolving internet and Web 2.0 technology, in addition to the growing number of savvy web users. Libraries found themselves lagging behind other sources (such as internet

search engines) in meeting user information needs. The library staff are generally frustrated by the lack of flexibility of traditional library systems. As early as 2007, Marshall Breeding pointed out that "as librarians continue to operate with sparse resources, performing ever more services with ever more diverse collections–but with no increases in staff - it's more important than ever to have automation tools that provide the most effective assistance possible." In his 2009 article, he deliberately says that "dissatisfaction with the current state of ILS products runs high. The areas of concern lie in their inability to manage electronic content and with their user interfaces that do not farewell against contemporary expectations of the web."

So what are the trends in libraries for the last decade in terms of library resources, collection, services, and resource discoveries? According to Breeding, there are three trends: "1. Increased digital collections; 2. Changed expectations regarding interfaces; 3. Shifted attitudes towards data and software.'' Andrew Pace notes that "web-based content, licensed resources, born-digital documents, and institutionally significant digital collections emerged rapidly to overtake the effort required to maintain print collections, especially in academic libraries.''

Another noticeable trend in the library technology field is occurring along with a similar trend in the general information technology field, that is, the open-source software movement. As Pace states, "open Source Software (OSS) efforts such as the Open Archive Initiative (OAI), DSpace, and Koha – just to name a few, as an exhaustive list would overwhelm the reader-challenged commercial proprietary systems, not only for market share but often in terms of sophistication and functionality." Now the gap is to find out, how best we can incorporate the ILMS in the library sectors in our country. Many of the articles deals with the automation in various libraries in the country but none have evaluated the prospects and challenges of ILMS in the various libraries in Bangladesh.

Research Methodology

To achieve the objectives of the study, the survey method of research was adopted. A structural questionnaire was designed and used for collecting data from different university libraries in Bangladesh. The questionnaire was developed on Google docs

and the same were sent to their mail along with a request letter explaining the importance and purpose of the study. In this study, to find out the present scenario of ILMS, data were collected from various entities of universities and medical colleges. Data are measured, quantified and analysis was done according to the requirement of the study. The study mostly made use of a mixed approach to meet the objectives of this paper.

Design: Here, the design of this study is used to explain the type of research whether experimental, survey, correlational, semi-experimental or review in nature. There are three main sections of research design, those are data collection, measurement, and analysis. To unearth the evolution of ILMS, to elucidate the development of the software, a qualitative approach was made. Again to focus on the present scenario and identify the prospects of ILMS in Bangladesh, quantitative analysis was done. Finally, to find out the challenges of ILMS in Bangladesh a qualitative analysis was done basing on the facts of quantitative analysis.

Sample: Here, sample in terms of research activities, is a group of people, objects or items that are taken from a larger population for measurement. The sample used here is the representative of the population to ensure that we can generalize the findings from the research sample to the population as a whole. For quantitative analysis as many as five public universities/institutions library were taken into considerations with as many as eight cardinals were considered. For more clarity, the Private Universities Library, Agricultural University's library, Medical Colleges Libraries were taken into considerations. To examine the prospects of ILMS in Bangladesh in terms of fully/ partially automated, the pie chart was used for easy understanding.

Research Instruments: Research instruments are measurement tools or helping tools designed to obtain data on a topic of interest from research subjects. In this study, we have pursued to collect data from various universities to reach a consensus for the ILMS in the respective universities.

Evolution of Integrated Library System

The integrated library framework was created in all parts of the world from the mid-1970s to date might be fitted into one of the four accompanying compartments.

1. The coordinated library frameworks were module-based frameworks with no or almost no joining between modules. This might be considered as original ILS. Flow module and inventorying module were the needs to part of these frameworks and were created to run explicit equipment staged working frameworks.

2. The second-age ILS gets compact between different stages with the presentation of working framework of UNIX and DOS-based frameworks. The ILS of this age offers joints between frameworks for a particular capacity and are of order driven or menu-driven frameworks.

3. The third era ILS is a completely coordinated framework dependent on a social database structure. They epitomized a scope of measures that were a critical advance towards open framework interconnection. Shading and Gui highlights, for example, windows symbols, menus, and direct control have become guidelines in these ages.

4. The fourth era ILS depends on a customer server design and encourages access to different servers over the web. These frameworks permit getting in to different sources from one media interface.

5. Modern incorporated library framework bears huge perspectives.

The evolution of ILS fosters four distinctive attributes of the cutting edge.

a. Comprehensive library assets the executives.
b. A Framework dependent on administration arranged engineering.
c. Meet the difficulties of the new library work process.
d. Next-age revelation layer.

6. Thus the advancement of ILS through the ages gives us a viable and direct user interface (UI) that supports access to numerous sources and administrations from one mixed media interface.

Development of the Software

1. Library Management System (LMS) is computer based-systems that mechanize one or every single utilitarian zone performed by a library. ILMS is to mirror the

way that all capacities are overseen through a focal database. The term 'integrated' is used to refer to a system in which all the library functional modules, such as acquisitions, circulation, cataloguing, serials control, budgeting and OPAC are processed against a single master bibliographic database.

2. A library is an assortment of predictable assets utilized by computer programs in the wake of building up the product. The all out procedure incorporates arrangement information, documentation, pre-schedule message formats, codes, different classes and type details. Building up a characterized programming render administration to track entire exchanges of books and materials accessible in the library.

3. ILMS is utilized to oversee interior and outer assets including unmistakable resources, money related assets, materials, and HR. It assists with looking at the benefits of open-source and the executives framework of a classical library. The upsides and downsides of ILMS can be most appropriate in the university libraries.

Some popular proprietary and open source ILMS are shown in Table 1:

Ser	Proprietary	Open-Source
1.	AutoLib	Bibliote Q
2.	Libex.Net	Evergreen
3.	Library Solution	Koha
4.	DLib	NewGenLib
5.	Sirsi Dynix-Dynix	Open Biblio
6.	Exlibris	PMB
7.	Voyager	EBITDA
8.	NexLib	Php My Library

Source: Real time collection

Table 1: Proprietary and open source ILMS

Overview of Library System

'Systems' means a totality of many a system interrelated to achieve some goals or render a service; an analysis of which would detect, locate and identify problems confronting an organization. Systems analysis is not a solution to problems, but it does suggest alternative solutions to problems. It is designed to help the management to bring structural changes in the organization to adjust to changes in the environment.

Since we are not concerned with the analysis of library systems but we refer to system analysis only to point out how innovation can be inducted into library administration. We shall present a simple total library system and then see how we may identify the problems in the library organization by charting the workflows. After that we make processes and systems in the library organization.

The following systems make a simple total library system:

A = Acquisitions System
P = Processing System
C = Circulation System

ch system in the total library system can be analysed in terms of the following flow process charts:

1) Acquisitions System: S ⟹ O ⟹ R ⟹ A = SORA = Acquisitions System

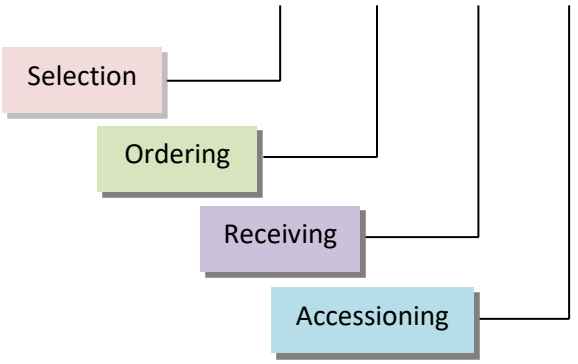
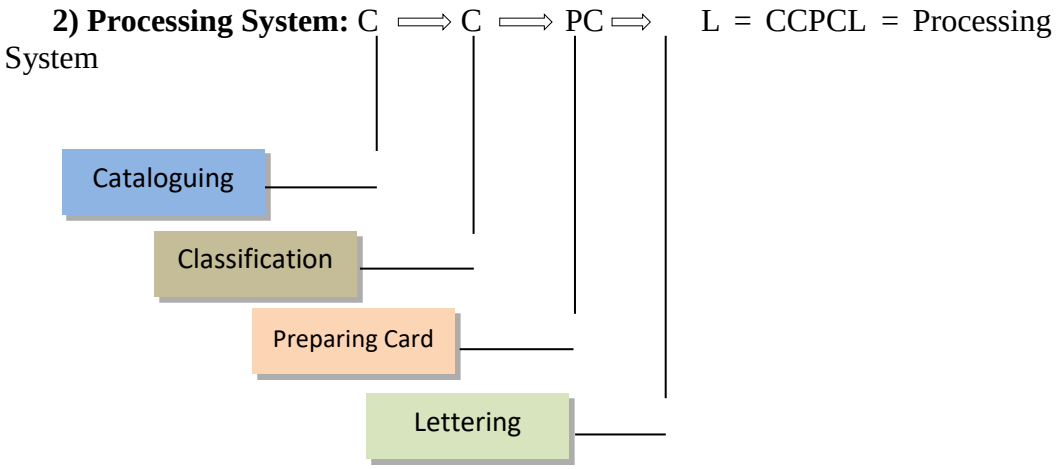
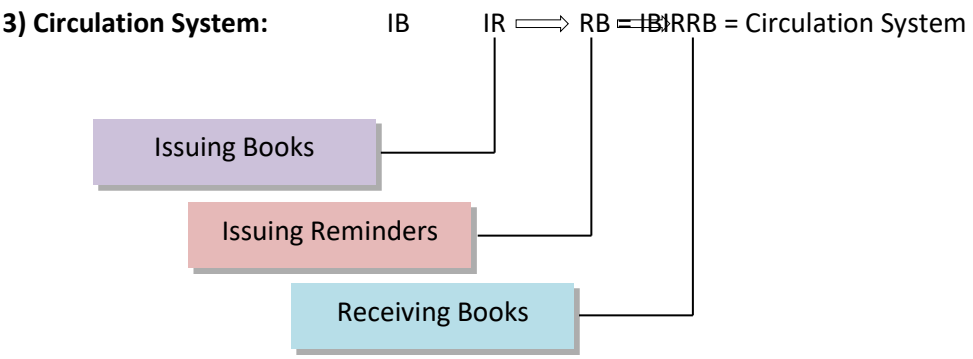


Figure 1: Acquisitions System



Source: Authors creation

Figure 2: Processing System



Source: Authors creation

Figure 3: Circulation System

Referring to the above flow process charts, we may say that in most of the modern libraries accessioning and cataloguing can be eliminated to reduce the volume of works.

Requirement Analysis of ILMS

The complete modern library management system there are different types of modules or features, which are:

1. Acquisition
2. Cataloguing
3. Online Public Access Catalogue (OPAC)
4. Circulation
5. Serial Control
6. Management or Report
7. System Maintenance Facilities of System Parameters

Technological Requirements for ILMS

In order to execute the library's technology requirements, the library will need to upgrade and acquire additional software that may be required for ILMS. Acquire scanners and handheld scanners are capable of digitizing research reading materials. Faster internet access and additional bandwidth are required to meet the unforeseen. Acquiring hardware is necessary to provide wireless access. Acquire video digitization tools and expand digital audio tools for recording new oral histories. Communication devices, like Telephone, Fax Machine and also modern photocopiers are also necessary for digitization. Upgrade selected hardware such as servers, workstations, laptops, printers, scanners, etc. New devices such as e-reader for both patrons and staff instruction and their uses are also require for digitization.

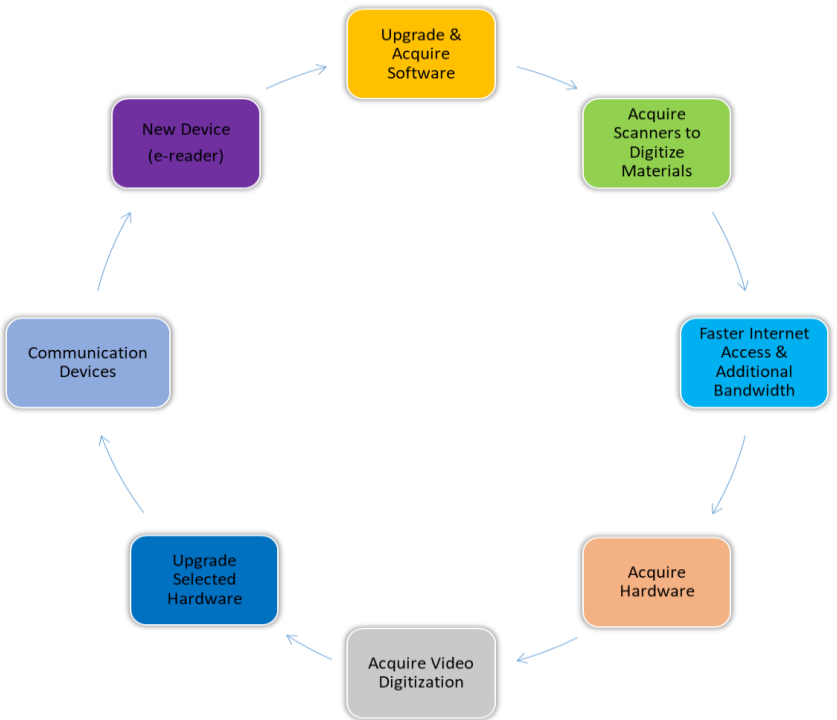


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Figure-4: Technological Requirements for ILMS

Techniques for Implementing ILMS

In order to develop integrated library system organizations have to follow some work procedures named as techniques. These techniques are as follows:

a. Convince authority for the integrated library system.
b. Selecting a user-friendly and cost-effective integrated library system.
c. Formation of effective and active library automation committee.
d. Budgeting to acquire new assets.
e. Prepare long term and short term work procedure according to road-map.
f. Hardware procurement for smooth functioning.
g. Testing and debugging for the adoption of expert personnel.
h. Arrange in training programs for ILS.
i. Data entry (Reading Materials and Users).
j. Growing awareness of the integrated library system.

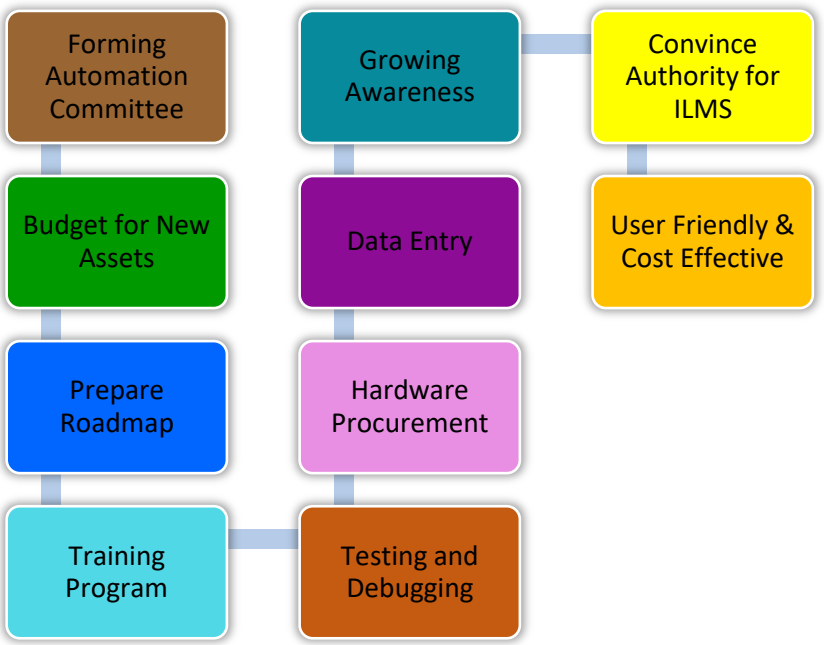

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Figure 5: Techniques for Implementing ILMS

Present Scenario of Integrated Library System in Bangladesh

The ILMS both in the public and private sector libraries of Bangladesh are not effective due to a lack of understanding of the values. The inadequate allocation of financial resources by respective authorities to build modern libraries is the deadliest barrier to structure the ILMS.

University Libraries:

Mostly we are concerned about the university libraries as these are the hub of higher education. The universities in Bangladesh are mainly categorized into public, private and international universities. The program of learning in the university must be supplemented by the library services. Library facilities are not only to support academic purposes but also to upgrade the quality of students. The well organized and properly administered university library serves as an invaluable aid in the conservation of knowledge and ideas by acquiring and processing reading materials. An effective integrated library system enables university libraries to provide user timely access to various library materials and reduces the amount of time spent on material acquisition. Without library automation or integrated library system university library cannot run effectively and ultimately the library loses its usability and acceptance. Realizing the fact, most of the university libraries become automated. Some of them are fully automated and some of them are partially automated. We mention the practical automation scenario of public university libraries in Table 2 and private university libraries in Table 3.

Name of Organization	Total Users	Total Collections	E-Resources	Name of ILS	OPAC	Circulation	Library Website	RFID
Dhaka University	42,000	6,80,565	E-journal (INASP & UGC)	DULIS	Yes	No	Yes	On Going
Bangladesh University of Engineering and Technology	8,100	1,53,390	E-journal (INASP & UGC)	KOHA	Yes	Yes	Yes	Yes
Rajshahi University	30,500	3,25,018	E-journal (INASP & UGC)	KOHA	Yes	No	Yes	On Going

Jahangirnagar University	25,500	1,10,000	E-journal (INASP & UGC)	No	No	No	Yes	No
Jagannath University	29,500	62,000	E-journal (INASP & UGC)	No	No	No	Yes	No

Source: Real time collection

Table 2: Public University's/ Institute's Library

Name of Organization	Total Users	Total Collections	E-Resources	Name of ILS	OPAC	Circulation	Library Website	RFID
North South University	19,500	89,500	E-journal (INASP & UGC)	Bi-lingual LMS	Yes	Yes	Yes	Yes
BRAC University	6,900	35,950	E-journal (INASP & UGC)	KOHA	Yes	Yes	Yes	On-Going
East West University	16,300	29,789	E-journal (INASP & UGC)	KOHA	Yes	Yes	Yes	No
Independent University, Bangladesh	18,147	34,530	E-journal (NASP & UGC)	KOHA	Yes	Yes	Yes	No
Daffodils International University	15,300	26,250	E-journal (INASP & UGC)	KOHA	Yes	Yes	Yes	No

Source: Real time collection

Table 3: Private University's Library

Agricultural Institution/ University Libraries:

Bangladesh Government has established 12 agricultural universities and some research organizations. Moreover, 4/5 agricultural universities exist in the private sector. Strong library management stimulates research activities and simultaneously new development of research can be materialized. Without automation, a library cannot serve its patron effectively. Five agricultural organization Libraries practical automation scenarios are presented in Table 4.

Name of Organization	Total Users	Total Collections	E-Resources	Name of ILS	OPAC	Circulation	Library Website	RFID
Bangabandhu Sheikh Mujibur Rahman Agricultural University	1,500	29,500	E-journal (INASP & UGC AGORA HINARI)	No	No	No	Yes	No
Ser-e-Bangla Agricultural University	2,750	39,793	E-journal (INASP & UGC AGORA HINARI)	Koha	Yes	Yes	Yes	Yes
Bangladesh Agricultural Research Institute	3,050	79,110	E-journal (INASP)	Customized	No	No	Yes	No
Exim Bank Agricultural University	210	3,000	No	No	No	No	No	No
Bangladesh Agricultural University	6,900	1,87,950	E-journal (INASP & UGC AGORA HINARI)	KOHA	Yes	Yes	Yes	No

Source: Real time collection

Table 4: Agricultural University Libraries

Medical College Libraries:

At present 30 governments, medical colleges and 59 private medical colleges exist in Bangladesh. The library plays an important and vital role in health and medical education. It is evident that most of the medical college libraries are manually operated. Practical automation scenarios of five medical college/ university libraries are mentioned in Table 5.

Name of Organization	Total Users	Total Collections	E-Resources	Name of ILS	OPAC	Circulation	Library Website	RFID
Bangabandhu Sheikh Mujib Medical University	920	35,910	E-journal (INASP & HINARI)	KOHA	Yes	Yes	Yes	No
Dhaka	2,050		No	No	No	No	No	No

Medical College		33,536						
Sir Salimullah Medical College	1,400	25,600	No	No	No	No	No	No
Arms Forces Medical College	950	11,250	No	No	No	No	No	No
BIRDEM	2,980	7,650	E-journal (INASP HINARI)	CDS/ISIS	No	No	No	No

Source: Real time collection

Table 5: Medical College Libraries

It is learned from the above tables that the use of ICT is meagre and also the absence of ILMS in most of the medical college libraries.

Army Educational University/ Institute Libraries:

Name of Organization	Total Users	Total Collections	E-Resources	Name of ILS	OPAC	Circulation	Library Website	RFID
Bangladesh University of Professional	10,000	30,000	UGC	KOHA	Yes	Yes	Yes	Yes
Military Institute of Science and Technology	4,500	64,635	E-journal (INASP & UGC)	KOHA	Yes	Yes	Yes	No
National Defence College	300	15,000	No	Customized Software	No	Yes	Yes	No
Defence Services Command and Staff College	400	26,000	No	Customized Software	No	Yes	No	No
Army Central Library	2500	65,000	No	Customized Software	Yes	Yes	Yes	No

Source: Real time collection

Table 6: Army Educational University/ Institute Library

Prospects of ILMS in Bangladesh

The education sector in Bangladesh is developing day by day. Technological advancement with internet technology has occurred in Bangladesh since the 1990s. Like other fields, a big change has occurred in the last couple of decades in the library sector. With the establishment of so many public and private universities, a great change has happened in the education sector. Most of the private universities have adopted recent technology in all fields including the library as they have available financial support. Many public universities try to upgrade their function and services including the library. But they face financial drawbacks and lack of technical staff (IT and library professionals). Agricultural University and organizational libraries try to develop their integrated library system with modern technologies including RFID.

It is observed from tables 2, 3, 4, 5, and 6 that integrated library system practice and ICT application in Private and Army University libraries is more advanced. A graphical presentation of the automation range of Public University libraries, Private University libraries, Agricultural University/organizational libraries, Medical College/University libraries and Army University/ Institute libraries are presented as

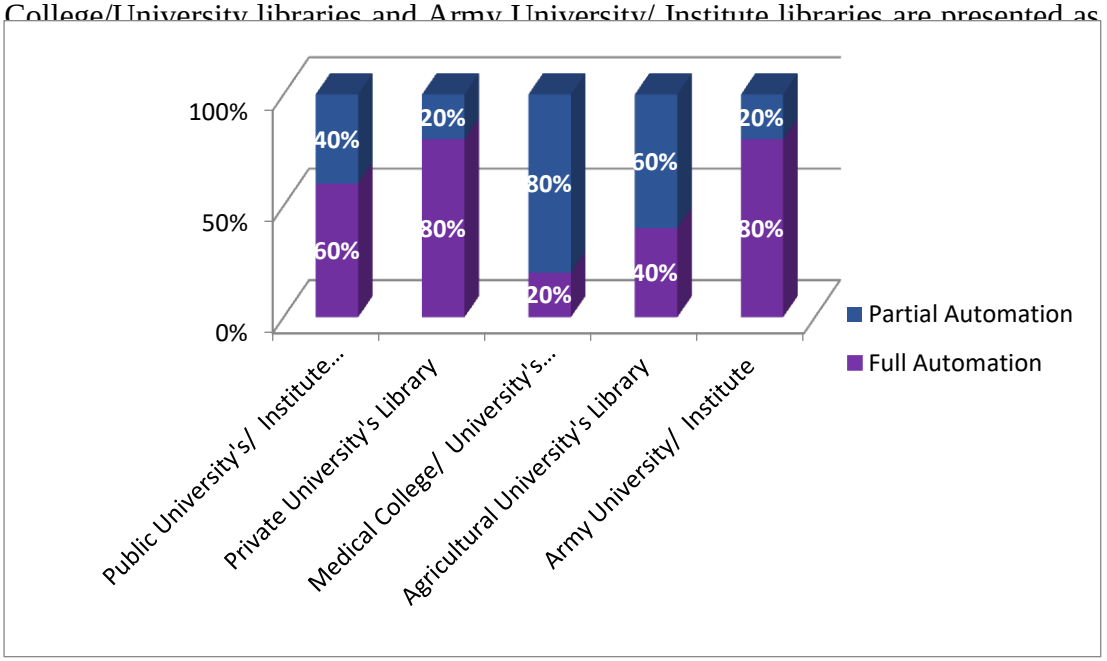

Figure 5: Proportion of repositories by continent

Source: Available at: http://www.opendoar.org (Accessed on 04 October 2017)

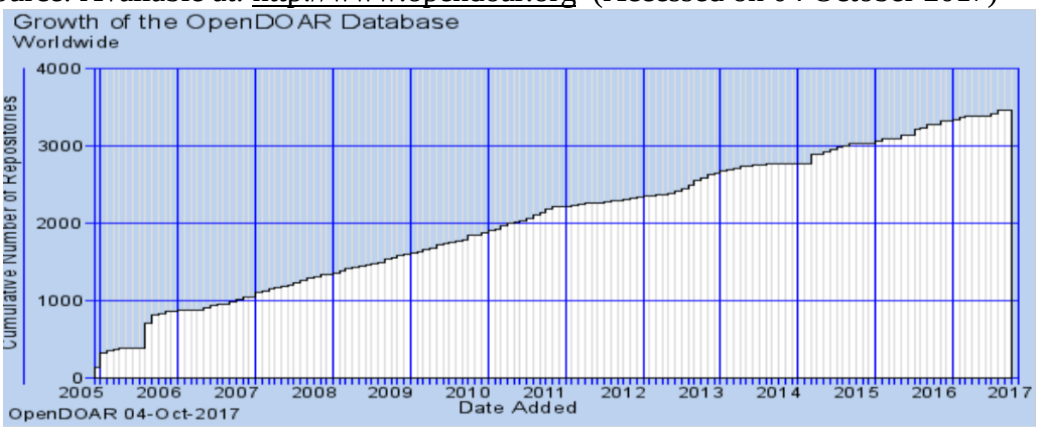

Figure 6: Full & Partial Automated

In Figure 6 it is observed that 80% of army and private university libraries are fully automated, whereas 60% of public university libraries are fully automated. The medical college and agricultural university libraries are partial automated.

Challenges of ILMS in Bangladesh

The ILMS has developed in the university/institution of Bangladesh. However, there are numerous challenges those are confronted by the organizations. Some of the observations on this topic that may be no longer true in some institutions, but they are still evident in many cases. In the near future, the dimension of challenges will be of much more variety in nature.

Manpower Factors: Integrated library system and e-library venture require huge information in the territories of PC building, PC organizing, establishment of programming, and preparing. The problems are to be united and co-ordinated to guarantee accomplishment towards the end. Administrators of the 21st century should support to conquer the hole in PC application and use which comprises a joining of comprehension among them and with framework investigators.

Lack of Training Facilities: Library staff needs proper training on library matters. They should be well-trained in discharging their duties. In a year,

there should be a timeline where the library personnel can be trained in their respective fields.

Lack of Technological Knowledge of Library Personnel: Library personnel like cataloguer, classifier and library assistant may have poor technological knowledge. So, creating online cataloguing, circulation of reading materials is a big challenge in the aspect of the ILMS.

Technological Factors

Technological factors play a vital role in developing and maintaining an integrated library system. A few important aspects are:

Most Upgraded Internet Facilities: For ILMS, it is a must to have the most upgraded internet facilities. This will enhance the facilities to the users and also to the administrators of the library.

ICT Infrastructure: A major test is in the zone of proceeding with supportable data transfer capacity with membership. Internet offices can be continued through membership and constantly persue the data transmission size. These will power up the quantity of PCs and the degree of web clients. The organization must be set up to finance the offices paying little heed to the other expenses.

Routine Maintenance of the System: There is a provocation of daily and routine maintenance of computers that are interlinked with servers. There is an urgent need to hire ICT personnel like System Analyst and System Administrator. There is a number of libraries that don't have any personnel to maintain the system.

Financial Factor: The financial aspect is a grey area in ILMS. Lack of steady funding in most vital cases is a barrier in automating the library project. Without a steady fund, progress cannot be achieved according to the road map. The allocation of the fund is a prime factor for procuring a required number of books of various groups and readers.

Information Aspect

The information aspect is more applicable in creating an OPAC and user database. Most of the users need easy access to information. They do not let the system to be critical.

User Friendliness of the Software: Library automation aims at "user-friendly" products. It depends on librarians; how they can express their users' information to the software developer. Enough bibliographic information has to be documented for the production of real user-friendly facilities. Scopes of documentation of information have to be embedded in the system. Well understanding of librarians and IT personnel should be matched. Practically it is indeed a big challenge in the overall scenario.

Bibliographic Standards: Processing library materials and standards such as cataloguing rules, the subject headings, standard terminologies or names in the form of authority files are highly required. To create OPAC in the ILMS system, the issue of standard, Machine Readable Catalogue (MARC) formats, characterized and indexing methodologies should be imperative in nature.

Needs of Informational Professionals: Professional expertise is required in our knowledge-based society. Effective communication is a fundamental and vital activity in all areas of education. In our country, professionals of technology based information in various libraries are scanty.

Conclusions

1. The evolution of ILMS gives us an insight into its importance in managing a modern library. ILMS is computer based-systems that forms the automation process. There are a number of functional modules against a single master bibliographic database.

2. ILMS deals with the acquisition, cataloguing, OPAC circulation and many other aspects. To promote library science and to make it more interesting to the reader, there are a number of technological plans that need to be surfaced for the betterment of ILMS. Several techniques for implementing ILMS has made the ILMS more interesting to the authority. The scholarly pursuance can help to build ILMS more strongly in the University/ College community.

3. The present scenario of ILMS states the encouragement to the collections and total users in various public, private, agricultural and medical colleges. ILMS stimulates

research activities and new development of research can be materialized. In terms of prospects of ILMS, fully automation is yet to achieve its credentials. There are number of challenges those are faced by the authority to make successful ILMS. Challenges are to be advanced for the settlement of prosperous learning. Bangladesh is going to achieve ILMS as a success within a very short span of time in the overall library science area.

Recommendations

1. In terms of fully automation system of the libraries, private universities are in the forefront, then comes the army universities/educational institutions. Again, if we think about the partial automation, the medical colleges libraries and public university libraries are at par. So in every cases, the fully automation should be pursued in implementing the ILMS.

2. There should be a sustainable network and power infrastructure for an effective library automation. Developing the software to be done carefully to provide the best possible service.

3. Adequate training program of information technology should be arranged for library professionals. They should be adequately equipped for acquisition, processing and circulation system.

4. Every academic library should have its own dedicated ICT personnel to monitor and develop the library management system.

5. To develop a uniform database management system, data experts must be furnished with a wide scope of new electronic/advanced data conditions.

6. There should not be any budgetary constraints and adequate financial support should be arranged for ICT application in libraries.

7. Formation of a strong and active library automation committee is needed to monitor and evaluate the automation project.

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