

Librarians' Attitude Towards Library Digitization



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Preface

The research has been conducted for finding out attitude of librarians toward library digitization or Information and Communication Technology. Due to certain limitations some well known public and private university libraries in Dhaka city has been considered under this study. The core objective of this study is to depict LIS professionals' ICT knowledge and their efforts toward self development in this regard. For this study the researcher considered the professionals who are working in the managerial level and distributed them in the categories of librarian, Deputy Librarian and Assistant librarians. The research encompassed 9 university libraries situated in the capital city Dhaka namely Dhaka University library, BUET university library, Jahangir University library, Sher-E-Bangla university library. On the other hand the private university libraries are: East-West university library, Independent university library, North-South University library, Asian International university library, BRAC university library. The research also describes the positive and negative opinions or views of librarians toward library digitization. The sample size may be very small but there were some limitations, few of targeted respondents were not interested to participate in the survey, few of them provided incomplete questionnaire etc.

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Chapter One

Introduction

Librarians worldwide are concentrating more and more toward library digitization as they offer convenient ways of information management and dissemination. As digital libraries are able to provide prompt services through the implementation of ICT research has become easier and the constraint of preserving library materials has declined to a large extent. But the most important advantages of a digital library are their ability to help society by making information more available, raising its quality, and increasing its diversity. In addition, electronics can offer many advantages to libraries. Single electronic copy can be accessed from a great many locations and many users can use them from different places simultaneously at any point of time and because of that the library does not have to purchase several copies of the same material, which saves money. Digitized collections are not damaged by extensive and frequent usage and it helps to prevent the document generation after generation. According to (Chowdhury and Chowdhury, 2004), the digitization of library materials provides us the following benefits:

- A digital library brings information to the user.
- Improved searching and manipulation of information.
- Improved facilities for information sharing.
- Timely access to information.
- Improved use of information.
- Improved collaboration.
- Reduction of the digital divide.
- Promote efficient delivery of information economically to all users.
- Strengthen communication and collaboration between and among educational institutions.
- Contributes lifelong learning opportunities. (Rahman)

A large proportion of a digital library's collection comprises materials that are born digital, such as e-journals, e-books, internet resources, databases, and so on. In Bangladeshi aspect, library resources are in a printed format and needs to be digitized to include in the library collection for electronic use.

In developed countries, when we look at the libraries of educational institutions (schools, colleges, universities, etc), we see that they are concentrating more and more on digitization and getting the benefits of modern technology which has also ensured prompt library services. Although Bangladesh is termed as a developing country, digitalized/automated library is not a new concept anymore here. Like many other developed countries various initiatives have been taken in many government and private educational institutions for library digitization. Library digitization is very essential for information seeking and their multipurpose uses. So no library can offer faster and smooth services without adoption of digital technologies. That's why all libraries are now walking toward digitization, though the speed everywhere is not the same. Some libraries are doing digitization in a very faster mode whereas others are very slow. When we look at public and private university libraries it is found that private university libraries are more advanced than public university libraries. The purpose of the research is to find out what are the reasons behind these inconsistencies. Librarians or LIS professionals' attitude might be a great factor that can help to cope with modern technologies. Through this study it has been tried to find out librarians' thinking about modern technologies or their views toward ICT application in library management system. Library professionals' expertise in building and managing a digital library system is one of the significant factors that ensure proper maintenance of a digital library.

Definition of Digital Library

Digitization is an electronic process of converging information from a print format to a digital format. A digital library is a collection of documents in organized electronic form, available on the Internet or on CD-ROM (compact-disk read-only memory) disks. Digital library also can be defined as a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network. The first use of the term digital library in print may have been in a 1988 report to the Corporation for National Research Initiatives. The term 'digital library' was first popularized by the NSF/DARPA/NASA Digital Libraries Initiative in 1994(Rahman). Borgman (1999) provides a more complex definition of digital libraries as below:

1. Digital libraries are a set of electronic resources and associated technical capabilities for creating, searching and using information. In this sense they are an extension and enhancement of information storage and retrieval systems that manipulate digital data in any medium (text, images, sounds; static or dynamic images) and exist in distributed networks. The content of digital libraries includes data, metadata that describe various aspects of the data (e.g. representation, creator, owner, reproduction rights) and metadata that consist of links or relationships to other data or metadata, whether internal or external to the digital library.

2. Digital libraries are constructed, collected and organized, by (and for) a community of users and their functional capabilities support the information needs and uses of that community. They are a component of communities in which individuals and groups interact with each other, using data, information and knowledge resources and systems.

Digital libraries are also referred to as electronic libraries, virtual libraries, libraries without walls or hybrid libraries are often used synonymously. A distinction is often made between content that was created in a digital format, known as born-digital, e.g. e-book, e-journal and information that has been converted from a physical medium, e.g. paper, by digitizing. The elements that have been identified by the Association of Research libraries (ARL, 1995) as common to all definitions are:

- The digital library is not a single entity;
- The digital library requires technology to link the resources of many;
- The linkages between the many digital libraries and information services are transparent to the end users;
- Universal access to digital libraries and information services is a goal;
- Digital library collections are not limited to document surrogates: they extend to digital artifacts that cannot be represented or distributed in printed formats

Characteristics/features/components of digital libraries

The key components of a digital library are listed below:

- Electronic resources—digital data in any medium.
- Computerized networked library systems
- Metadata.
- Skilled library professionals or well-trained manpower.
- Digitization devices and techniques.
- Information storage devices.
- Digital library software and
- Community of users—their information needs and uses (Rahman)

How much library digitization is dependent on the willingness of the librarian?

Due to the advent of Internet, World Wide Web and proliferation of online catalogue, the role of librarian has been changed. Librarian should be knowledgeable in a variety of information sources and follow the new trends and advancements in computers, media and publishing. The implementation of Information and Communication Technology in the library depends largely on the librarian's attitude in this digital environment. The application of ICT has caused significant changes in libraries: automated cataloguing, circulation, information retrieval, electronic document delivery, and CD-ROM databases, attitudes are "inclinations and feelings, prejudices or bias, preconceived notions, ideas, fears and convictions about any specific topic" (Taiwo, 1998), who states that an attitude "is a mental and neutral state of readiness organized through experience exerting a directive or dynamic influences upon individual's response to all objects or situations with which it is associated." There are some perspectives can be identified as the influence factors of the professionals' attitudes that are numerous, such as educational background, experience in using information technology, and their perceptions about IT, professional qualifications, lack of training, gender, personalities, knowledge of IT, IT fear, salary, professional status, working environments, etc. The attitudes might also be influenced by the age as well as the working experiences. As Bruce Miller suggests, the most significant challenge in shifting from an old to a new model library is social: convincing professionals who

are good at what they do to do something new, and training them to adopt new roles. Librarians may resist change because they are accustomed to doing things a certain way, worry about losing their jobs, or fear change, or because their organization is rigid and static (Weiner 2003). Some may also worry that our common cultural legacy will decline if libraries replace print collections with electronic. Some basic conclusions can be drawn from the above mentioned studies. These are as follows:

- Library professionals who have some knowledge of technology may have less resistant to technology. This means that professional qualifications and knowledge does show positive attitudes towards information technology.
- The type of the library, sex and different managerial positions of the librarians' and experience on the job does not make any significant difference in attitudes towards information technology.
- The higher the age, the more chances of resisting technology innovations. More experienced professionals are *less* enthusiastic about new developments in information technology.

Librarians' resistance to change can be overcome through communicating clearly, providing training and development opportunities.

Role of a librarian in a digital library

Librarians play an important role in the development and management of a digital library. They have to maintain some common responsibilities:

- select, acquire, preserve, organize and manage ICT/digital collection;
- design the technical architecture of ICT/digital library;
- Plan, implement, and support ICT/digital services such as information navigation, consultation.
- establish user interface over network;
- set up policies for the ICT/digital library;
- protect digital intellectual property in network environment and

- Ensure information security.

The duties of digital librarians can also be viewed from different perspective. The role of a digital librarian is more than just having ICT skills. To describe the roles of the digital librarian, the following concepts are introduced to understand further.

a. Guardian of information superhighway: The information superhighway is a vision; it mentions the two-ways: wired and wireless capabilities of telephones and networked computers Services. Librarians play an important role for managing those.

b. The digital librarian acts as an intermediary in the task of massive digitization of information, its storage, dissemination, managing the archive, and making available digitized networked information to the end users.

c. The digital librarian is an expert in navigation, browsing and filtering, digital reference services and electronic information services from the digital information sources.

d. Librarian in the digital area act as an intermediary who brings together users and information.

e. There are a variety of information retrieval techniques, including metadata searching, full-text document searching. In knowing what can or cannot be retrieved from the digital library information sources, the digital librarian acts as an expert in the acquisition of digital information.

Competencies and skills of a librarian in the management of digital libraries

The competency of a digital librarian is represented by different sets of skills, attitudes and values that enables a librarian to work as information professional or knowledge worker in the digital environment. There are skills and competencies that the digital librarian should develop. Competency and skill means the ability to manage the digital libraries and digital knowledge. The followings, given in the table below are the skills and competencies required for a digital librarian in the management of digital information systems and digital libraries:

Area	Skills and competencies
Internet related skills	Searching, browsing, filtering; retrieving, accessing, digital document analysis, digital reference services, electronic information services, content conversion, downloading techniques, archiving digital documents, locating digital sources, digital preservation and storage, electronic messaging, connectivity skills.
Multimedia, digital technology, digital multimedia processing	Multimedia indexing, image processing, visualization, cataloguing and classification of digital documents, conferencing techniques including teleconferencing, video conferencing.
Internal networks	Personal networks, project teams, internal digital knowledge resource, intranets.
External networks	External knowledge resources, external personal networks, customers, suppliers, partners, extranets.
Software related skills	DL architecture and software, Technical and quality standard, Web markup languages, Database development and management systems, Web design skills.
Library related skills	Understanding the needs of users, Digital archiving and preservation, cataloging, Indexing, abstracting, Collection development.
Others	Communication and interpersonal skills, Project management/leadership skills, Grant/proposal writing skills, teaching and group presentation skills.

Current status and initiatives of digital library development in Bangladesh

At present the Bangladesh government has already taken various steps and initiatives to fulfill the target of achieving ‘Digital Bangladesh’ by 2021. In education sector, Digital Bangladesh visualizes that by 2021 all universities, colleges, high schools and primary schools will have computerized connectivity. The goal is to improve the quality of education. Quality of education of a country is impossible without the modernization of libraries. Bangladesh has 34 public universities, 54 private universities and two international universities (UGC, 2009). It is recognized that public libraries play an important role for establishing a knowledge-based society, though public libraries in Bangladesh got little importance and status. The use of ICT in public libraries are spreading very slowly although they have to go a long way to be digital in the real sense. According to different personal investigation and survey it has been evident that there exists neither digital library nor any integrated automated library system in the country in true sense of the term. Another fact is that at present around 60% urban based libraries and information centers have brought computer and other ICT equipment in use. Digitization and automated library systems in Bangladesh are still in the infancy level (Alam and Islam). Only a very few leading private universities have automated system.

East West University library: EWU Library uses Greenstone Digital library software(a often source software) for its various strong features, simplicity, user friendliness both for staff client and end user, standards, support from international organization etc. (Begum, Rashid et al.).

BRAC University Library: BRAC University library has successfully formed an Institutional repository using open source software Dspace. The Digital Institutional Repository program was funded by the International Network for the Availability of Scientific Publications (INASP) in April, 2007. **Independent University Library, Bangladesh:** The library provides OPAC service for books and journal articles from Dhaka campus and as well as Chittagong campus.

They subscribes to following host of e-journals; AOM, ACM, ACS, CUP, E-journals.org, IEEE, JSTOR, OUP, Project MUSE, Science Direct, etc. (Independent University website).

Islamic University of Technology (IUT) Library: IUT Library is working continuously to automate the library and establish a digital library for the own publications, theses and dissertations of the students. They already developed a digital library using greenstone digital library software.

BANBEIS library: Bangladesh Bureau of Educational Information & Statistics (BANBEIS) is a

central depository of Bangladesh government for the collection, dissemination and provider to all stakeholders. To establish digital library they are using Koha and Greenstone Digital Library Software. <http://www.banbeis.gov.bd/ebook.php>.

Comparatively, private universities are ahead of the public universities. Among the 21 public universities, the University of Dhaka and the Bangladesh University of Engineering and Technology (BUET) are providing automated library facilities. Some universities, like Rajshahi University, Chittagong University, Jahangir Nagor University, Shahjalal University of Science and Technology, Khulna University and Islamic University, are using computers but they have not yet introduced computers for automated library services. In most of the cases the library is on the way to be a digital library.

Objective

The main objective of this study is to investigate how much the library professionals are interested to build digital libraries or attitudes of librarians towards application of information technology in library management. The specific objectives are as follows:

1. To examine the concern libraries' present state of digitization
2. To determine the ICT education and skill attained by library professionals required to become digital librarians.
3. To examine the librarians' role in IT-related decision-making.
4. Providing recommendations based on the findings that will help in full fledged digital library development.

Methodology

The design of the study is a descriptive survey on the attitudes of librarians' toward library digitization. A questionnaire was designed to collect data from librarians of nine university libraries including both public and private in Dhaka city. Four of the educational institutes are government and five of them are private. Among the government educational institutes two General University, two specialized universities – Agriculture University, Engineering University library. Beside this, among the private university libraries, there are five universities

have been selected. Respondents were grouped into three categories (Librarian, Deputy Librarian, assistant librarian) based on designation. The questionnaire was divided into three sections like personal information and attitudes of library professionals towards ICT in libraries. Targeted respondents were sixty five. Out of 65 respondents, 46 respondents were participated and 43 questionnaires were received back, 7 questionnaires were found incomplete. The data were analyzed using STATA.

Period of data collection

Data have been collected during 13 – 24 February, 2014.

Data collection tools

Information is collected from librarians through face-to-face with a formal semi-structured questionnaire and one-to-one in-depth interview. The questionnaire has been divided into three parts:

Part 1: Demographic variables and status of the libraries.

In this part, the items that have been included are: designation of the respondent, experience of current position, total experience in LIS profession, academic qualification, gender, age group, category of library, library management system software, library website and using of barcode.

Part 2: Qualification and training of library professionals on ICT

This part contains several items which include experience of using computer, expert in ICT, level of ICT education, plan to obtain a formal degree on ICT in future, opinion to become ICT literate, supporting methods to become ICT literate, participation in training courses, seminars and conferences and involvement in the training courses arranged by organization.

Part 3: Attitudes toward Information and Communication Technology

This part of the survey contains ten items measuring librarian attitudes toward the use of ICT in libraries. They relate to both positive and negative effects of ICT. Respondents were asked to rate their belief about ICT applications to library practices on a 2-point scale: 1 = Yes, 2 = No.

Rationale of the study

As the world is going through the technological revolution, adoption of new technologies in the education system is the most important. Rapid advances in information technologies have revolutionized the role of libraries. Librarians, being key stakeholders in the development of libraries, play a strategic role in application of IT in libraries. I want to conduct this study for identifying current status of ICT in some educational institutions and educational organizations. The information professionals of the developing countries like Bangladesh are grappling with problems like weak infrastructure, lack of skilled manpower, financial stringency etc. The main objective of this study is to identify the thoughts of librarians towards digital library and also identify factors affecting attitudes of librarians towards application of IT in libraries or problems faced by the librarians, to find out level of IT related skills and competencies, what about the financial facilities, training facilities and finally identifying some potential suggestions that may be effective for library digitization.

Scope of the study

At present there are 34 public universities and 77 private universities (UGC, 2006) in Bangladesh. Among the universities the numbers of public and private universities situated in Dhaka city are 8 and 50 respectively. But due to time and financial constraints it was decided to survey five libraries from each category. However, during practical survey noncooperation by the library professionals led me to squeeze the number of libraries from 10 to 09. So, at last only 4 public and 5 private universities were considered under this study.

Public university libraries

University of Dhaka: The University of Dhaka, established in 1921 under the Dacca University Act 1920 by British Imperial Government. Academic activities started on July 1, 1921. Today, it is the largest public university in Bangladesh. The Dhaka University Library (DUL) is the oldest and largest academic library in the Bangladesh. The library holds more than half a million books, bound journals, newspapers, etc. According to the official sources, the library is going to

implement a full-function integrated automation soon. Very recently they have initiated to develop an institutional repository by locally digitizing its 30,000 handwritten manuscripts, 20,000 rare books, 5,000 microfilms and many special materials.(Alam and Islam).

BUET: Bangladesh University of Engineering and Technology is the oldest institution for the study of Engineering and Architecture in Bangladesh. First the name was the Ahsanullah School of Engineering offering three-year diploma courses in Civil, Electrical and Mechanical Engineering. After the war of Liberation in 1971, Bangladesh became an independent state and the university was renamed as the Bangladesh University of Engineering and Technology. BUET central library has a great compilation of books, journals, periodicals and monographs of the relevant engineering fields. The Central library has a collection of over 132,000 volumes and 218 current periodical subscriptions. Per year 1500 volume are added to this library. It also has a free internet browsing facility and a rental library program. There are also departmental libraries in each department and a hall library in each of the residence halls (buet web site).

Sher-e-Bangla Agricultural University: Sher-e-Bangla Agricultural University is the oldest agricultural institution in Bangladesh and South Asia, situated in Sher-e-Bangla Nagar, Dhaka. It was established on December 11, 1938 as Bengal Agricultural Institute (BAI) and later upgraded to university in 2001 renaming Sher-e-Bangla Agricultural University. SAU Central Library has a collection of around 30,000 books comprising the major subjects of agriculture and related subjects. It also collects all the popular national journals related to agriculture and a few international journals. The library is using Koha as library management software. Now the library is on the way toward automated library.

Jahangirnagar university: Jahangirnagar University is a public university in Bangladesh, located in Savar Upazila, Dhaka. It is the only one fully residential university in Bangladesh which was established in 1970 by the government of Pakistan. Jahangirnagar University has a big library having a huge collection of book established 1985. The whole area is covered with WI-FI technology. There are more than 110,000 books & 14,000 hard bound journals & 22,000 online journals in the library. More than 170 students can seat & study in the library. There is also a cyber center in the premises of the library.

Private university library

North South University or NSU: is the first government-approved private university of Bangladesh. The government of Bangladesh approved the establishment of North South University in 1992 under Private University Act (PUA) 1992. The university was formally inaugurated on 10 February 1993 by then Prime Minister of Bangladesh. The NSU has a semi automated library using its own library management software, which supports web-based online circulation system, full-text e-books and online journal article services. As of March 2010, the library holds 32000 books, 5,700 bound journals (Asian and local) and magazines, 1,300 CD-ROM databases and books, 103 videos, 159 audio-cassettes, and 62 DVDs.

East West University (EWU): was established in 1996 by the Private University Act, 1992. Its own campus is in Jahrul Islam City, Aftabnagar. In 2007, Web metrics ranked EWU third among all universities of Bangladesh (first among *private* universities in Bangladesh) based on web visibility of electronic publication, scientific results and international activities. East West University has a library which contains 21,700 books, a subscription to 135 international and national journals (hardcopy), 3,300 online journals on its database, subscription to 16 national daily newspapers and around 1,500 CD-ROMs and audio cassettes. Dspace and Greenstone Digital library software EWU Library decided to use GSDL for its various strong features, simplicity, user friendliness both for staff client and end user, standards, support from international organization etc.

BRAC University: The University was established by BRAC in 2001. BRAC University began in 2001 with fewer than 100 students. Now, it has grown to more than 7000. There is a nice library on the 2nd floor of the Admission Building in this University. The library has 40000 books; it remains open from 8a.m. to 9p.m every day. Koha, the first and most advanced Open Source Integrated Library System (ILS) in the world, was launched at BRAC University

Independent University, Bangladesh or IUB: Its campus is in Bashundhara, Dhaka. The university was established in 1993. Most of the collections of the IUB Library are closely related to the university's courses. The Library resources include books, periodicals, university catalogues, newspapers, audiocassettes, video cassettes, DVD/CDs, data disks etc.

American International University, Bangladesh: AIUB is a renowned private research university located at Banani in Dhaka, Bangladesh. The university is an independent organization with its own Board of Trustees. The library of AIUB is the collection of the knowledge and built up a balanced and rich collection in Business Administration, Science and Technology, Computer, Arts and Social Science. It is an open library system to students of AIUB, which provides rich collection of books including journals, newsletter, thesis works, audio-visual materials and CDs. The total collection of the library is about 50,000 including more than 26,000 books, about 100 journals and other articles, periodicals, CDs, video covering more than 80 academic areas. AIUB library has "Library Management System" the software which has been created by university IT department and now the system is operational.

Chapter Two

Review of Literature

Existing literatures on the topic were studied and reviewed from published and unpublished materials, such as journal articles, theses, and research reports, books on relevant topics available in libraries and online databases and the Internet. Librarians' attitude toward IT refers to their personal opinions and beliefs about importance, impact, worth and usefulness of computer hardware, software, email, internet and other information and communication technologies in library operations, resources, services and systems. (Ramzan). Nair (2001) has determined that the success or failure of IT application in libraries depends on the attitudes of the librarians because they are the key responsible persons for initiating changes, innovations and for planning and implementation of IT projects in their libraries. Studies on librarians' attitudes toward the application of IT in libraries have been conducted in Nigeria (Uwaifo 2007), (Kinengyere 2007), (Pors 2005), (Spacey, Goulding et al. 2004), United States (Olsgaard 1989), Iran(Zalzadeh; Davarpanah 2003). The findings of these studies indicate that one of the major barriers in implementing and enhancing the use of IT in libraries is not technical but attitudinal. They have indicated that the attitudes of librarians are an important force that can change the shape of libraries and information services in a country. According to Ramzan there are some organizational variables those affecting librarians' attitudes toward IT such as size of Libraries, their location, budget; IT related decision-making processes , type of library , supportive environment , sufficient opportunity to learn the Internet.

Allen and Williams (1994) mentioned that library leadership is responsible for managing and implementing technology innovations in libraries.

In the study "Information technology applications in East Africa government-owned university libraries" Mulimila found that Financial constraints and lack of IT trained library staff are the most critical obstacles in the application of information and communication technology (2000). Willingness to adopt new technologies is the key to their successful implementation in libraries(Ramzan).

Another study found that the intensity of librarians' fears in IT handling, ability to cope with the ever-changing IT innovations and their level of understanding of IT-based rules and regulations were good predictors of librarians' attitudes toward information technology.(Ramzan and Singh).

In their study entitled "Internet adoption and assimilation in Kenyan university libraries" Odero-Musakali and Mutul found that most library employees are not ready to embrace and integrate information technologies in their routine operations (2007).

In the study "Information technology applications in East Africa government-owned university libraries" Mulimiashows that financial resources and lack of trained manpower in IT remained the most critical obstacles in the application of information technology in East Africa government-owned university libraries. (2000).

"Factors predicting the use of technology: Findings from the center for research and education on aging and technology enhancement (CREATE)". From this title Findings indicate that the older adults were less likely than younger adults to use technology in general, computers, and the World Wide Web. The results also indicate that computer anxiety, fluid intelligence, and crystallized intelligence were important predictors of the use of technology. The relationship between age and adoption of technology was mediated by cognitive abilities, computer self-efficacy, and computer anxiety(Czaja, Charness et al. 2006).

The title "Attitudes of academic library professionals towards computer-based systems in Taiwan" **Students' tests of the categorizations of attitudes indicate that librarians in Taiwan are significantly more negative towards computers in general (Su 1993).**

"Attitudes of Librarians in Selected Nigerian Universities toward the Use of ICT" shows that librarians have a positive attitude toward ICT and that training and knowledge are the sine qua non for a positive attitude (Adekunle, Omoba et al. 2007).

Chapter Three

Data Analysis

Analysis has been done on the basis of core questions included in the research questionnaire reflecting the attitude of librarians regarding library digitization and data have been summarized using STATA 13 SE and finally the resulted values have been shown through the following heads.

Table-1A: Demographic information of librarians

Description		Total	Percentage
Designation	Librarian	7	100%
	Deputy librarian	18	
	Assistant Librarian	18	
Experience (in years)	Below or 5	4	100%
	6-15	14	
	Above 15	25	
Qualification	M Phil/PhD	6	100%
	Master	32	
	Others	5	
Gender	Male	32	100%
	Female	11	
Age	Below or equal 35	13	100%
	36-45	16	
	Above 45	14	
Category of library	Public university library	22	100%
	Private university library	21	

The study was conducted among 9 university libraries where the number of participated respondents is 43. The researcher focused basically on those LIS professionals who are directly involved in the management of the library or a section of it thus the categories of respondents fallen in the following three groups: Librarian, Deputy Librarian, Assistant librarian. In the table three categories of respondent are shown based on experience, qualification, gender, age group and category of library.

Table-1B: Demographic information of the libraries

Name of the library	Library management software		OPAC	Library Website	Use of Barcode
	Yes	Type			
American International university library	√	CS	√	√	√
BRAC university library	√	OSS	√	√	√
BUET library	√	CS	√	√	√
Dhaka University library	√	CS	√	√	√
East-West university library	√	OSS	√	√	√
Independent university library	√	OSS	√	√	√
Jahangirnagar university library	√	CS	√	×	×
North-South university library	√	CS	√	√	√
Sher-E-Bangla Agricultural university library	√	OSS	√	√	√

Note: CS – Customized software, OSS – Open source software

From table 1B it is found that almost all university libraries have already introduced the ICTs those will gradually help in the development of a full-fledged digital library. Among the libraries only Jahangirnagar University Library does not have its own website and barcode facility. However the significant factor to be mentioned here that none of these libraries is using package software rather majority of the libraries, whose corresponding number is 5, are using customized software and four of the libraries are using open source software. Another important factor to be noticed from the above table is that in spite of financial and technological affluence majority of the private university libraries are using open source software.

Table 2. Attitudes toward Information and Communication Technology

Statement	Attitudes Toward ICT				Rank
	Yes	No	NR ^m	Total	
You like to know more about ICT	36 83.7%	2 4.7%	5 11.6%	43 100%	1
You can apply ICT in your work environment	30 69.8%	8 18.6%	5 11.6%	43 100%	4
It is difficult for Bangladeshi librarians to cope with the ever changing technologies	15 34.9%	21 48.8%	7 16.3%	43 100%	7
You can retrieve information in any combination from your database	25 58.1%	11 25.6%	7 16.3%	43 100%	5
ICT provides high level security for the library resources	31 72.09%	4 9.3%	8 18.6%	43 100%	3
Data storage on computer is highly risky in libraries compared to print resources	13 30.2%	23 53.5%	7 16.3%	43 100%	8
Training is essential at every level of ICT up gradation in libraries	35 81.4%	3 7.0%	5 11.6%	43 100%	2
It is not feasible to bring about frequent changes in ICTs used in library management	20 46.5%	16 37.2%	7 16.3%	43 100%	6
Library education programs should be increased to raise user acquaintances with the latest developments of the library	36 83.7%	1 2.3%	6 14.0%	43 100%	1
Application of IT in libraries is not librarians responsibility, computer professionals need to do this	9 20.9%	26 60.5%	8 18.6%	43 100%	9

^m Non-response

Table 2 shows us, overall 83.7% LIS professionals are interested to learn more about ICT and 4.7% respondents reported that they have not anymore interest to learn more on ICT. It is to report here that 5 respondents did not response to the question which is 11.6% of the total respondents. Among the 43 respondents, 69.8% reported that they can apply ICT in their work environment and 18.6% replied that they cannot apply. It is also seen that there are 11.6% respondents who did not answer the question. It is revealed that 35% of the respondents think that coping with ever changing technologies is difficult for Bangladeshi LIS professionals but around 50% believes that it is not a difficult task for Bangladeshi LIS professionals and more than 16% respondents did not reply for this question. The study founds around 58% respondents who can retrieve information in any combination from database, 25.6% cannot do that and like other questions 16.3% respondents did not reply. A major portion of the respondents believes that ICT provides high level security for the library resources which is very likely but unexpectedly there are 9.3% LIS professionals who do not believe this and 18.6% non-response was found for the question. Data storage on computer is highly risky in libraries compared to print resources was reported by 30.2% respondents but 53.5% think that it is not risky and 16.3% respondents did not answer anything for this query. Most of the LIS professionals (81.4%) consider training essential at every level of ICT up gradation in libraries and 16.3% did not reply. Here a very few respondents do not think training essential. We wanted to know what the LIS professionals think about the feasibility to bring frequent changes in ICTs used in library management and found 46.5% and 34.2% think feasible and not feasible, respectively and 16.3% did not answer. As was expected, most of the respondents (83.7%) believe that library education programs should be increased to raise user acquaintances with the latest developments of the library and remaining 17.6% includes them who do not believe this and the non-responses. Unexpectedly 20.9% LIS professionals want to say that application of IT in libraries is not librarians responsibility, computer professionals need to do this but most of them (60.5%) do not believe that and remaining 18.6% is non-response. A very common scenario is found that for each question around 15% respondents did not answer.

Table 3. Attitudes toward Information and Communication Technology vs Designation

Statement	Librarian			Deputy Librarian			Assistant Librarian		
	Yes	No	NR ^m	Yes	No	NR ^m	Yes	No	NR ^m
You like to know more about ICT	7 100%	0 0%	0 0%	13 72.2%	1 5.6%	4 22.2%	16 88.9%	1 5.6%	1 5.6%
You can apply ICT in your work environment	7 100%	0 0%	0 0%	8 44.4%	6 33.3%	4 22.2%	15 83.3%	2 11.1%	1 5.6%
It is difficult for Bangladeshi librarians to cope with the ever changing technologies	2 28.6%	5 71.4%	0 0.0%	5 27.8%	8 44.4%	5 27.8%	8 44.4%	8 44.4%	2 11.1%
You can retrieve information in any combination from your database	6 85.7%	1 14.3%	0 0.0%	6 33.3%	7 38.9%	5 27.8%	13 72.2%	3 16.7%	2 11.1%
ICT provides high level security for the library resources	5 71.4%	1 14.3%	1 14.3%	11 61.1%	2 11.1%	5 27.8%	15 83.3%	1 5.6%	2 11.1%
Data storage on computer is highly risky in libraries compared to print resources	2 28.6%	5 71.4%	0 0.0%	5 27.8%	7 38.9%	6 33.3%	6 33.3%	11 61.1%	1 5.6%
Training is essential at every level of ICT up gradation in libraries	7 100%	0 0.0%	0 0.0%	12 66.7%	2 11.1%	4 22.2%	16 88.9%	1 5.6%	1 5.6%
It is not feasible to bring about frequent changes in ICTs used in library management	1 14.3%	6 85.7%	0 0.0%	9 50.0%	3 16.7%	6 33.3%	10 55.6%	7 38.9%	1 5.6%
Library education programs should be increased to raise user acquaintances with the latest developments of library	7 100%	0 0.0%	0 0.0%	13 72.2%	0 0.0%	5 27.8%	16 88.9%	1 5.6%	1 5.6%
Application of IT in libraries is not librarians responsibility, computer professionals need to do this	0 0.0%	7 100%	0 0.0%	3 16.7%	8 44.4%	7 38.9%	6 33.3%	11 61.1%	1 5.6%

^m Non-response

From Table 3, we find all the university librarians are interested to learn about ICT whereas 72.2% and 88.9% deputy librarians and assistant librarians, respectively are interested to learn about ICT. Although, in terms of ICT application in everyday activities 44.4% of deputy librarian and 83.3% of assistant librarian can use ICT in their work environment, all librarians can do it. It is also seen that 28.6% librarian think that it is difficult for Bangladeshi librarians to cope with the ever changing technologies which is very similar to deputy librarians (27.8%) but this proportion is much higher among the assistant librarian (44.4%). It is found that 85.7% librarian have the capacity of retrieving information from electronic sources which is much lower among the deputy librarian (33.3%) but this picture is much better among assistant librarian (72.2%) than the deputy librarians. Around seventy percent (71.4%) of the librarians believes that ICT provides high level security for the library resources; on the other hand only 61.1% deputy librarians do believe but most of the assistant librarians (83.3%) supported the view. Among the librarians, deputy librarians and assistant librarians, around 30% consider that data storage on computer is highly risky in libraries compared to print resources but most of the librarians (71.4%) and assistant librarians (61.1%) do not think so. Unexpectedly one third of the deputy librarians did not answer the question. All librarians got agreed that training is essential at every level of ICT up gradation in libraries and most of the assistant librarians (88.9%) believe that although only two third of the deputy librarians became agree with the statement. Although very few (14.3%) librarians do not see any problem in bringing frequent changes in ICT used in library management, half of the deputy librarians consider it as infeasible and more than half (55.6%) of the assistant librarian do not support frequent changes in ICT used in library management. About all the LIS professionals – librarian (100%), deputy librarian (72.2%) and assistant librarian (88.9%) agree that library education programs should be increased to raise user acquaintances with the latest developments of library. Very expectedly no librarians and deputy librarians agree that application of IT in libraries is not librarian's responsibility, computer professionals need to do this, but one third of the assistant librarians do believe that.

Table 4. Attitudes toward Information and Communication Technology vs experience

Statement	Below or equal 5 years			6-15 years			Above 15 years		
	Yes	No	NR ^m	Yes	No	NR ^m	Yes	No	NR ^m
You like to know more about ICT	4 100.0%	0 0.0%	0 0%	13 92.9%	1 7.1%	0 0.0%	19 76.0%	1 4.0%	5 20.0%
You can apply ICT in your work environment	4 100.0%	0 0.0%	0 0%	12 85.7%	2 14.3%	0 0.0%	14 56.0%	6 24.0%	5 20.0%
It is difficult for Bangladeshi librarians to cope with the ever changing technologies	3 75.0%	1 25.0%	0 0.0%	5 35.7%	9 64.3%	0 0.0%	7 28.0%	11 44.0%	7 28.0%
You can retrieve information in any combination from your database	3 75.0%	0 0.0%	1 25.0%	10 71.4%	4 28.6%	0 0.0%	12 48.0%	7 28.0%	6 24.0%
ICT provides high level security for the library resources	4 100.0%	0 0.0%	0 0.0%	11 78.6%	2 14.3%	1 7.1%	16 64.0%	2 8.0%	7 28.0%
Data storage on computer is highly risky in libraries compared to print resources	2 50.0%	2 50.0%	0 0%	5 35.7%	9 64.3%	0 0.0%	6 24.0%	12 48.0%	7 28.0%
Training is essential at every level of ICT up gradation in libraries	4 100.0%	0 0.0%	0 0.0%	13 92.9%	1 7.1%	0 0.0%	18 72.0%	2 8.0%	5 20.0%
It is not feasible to bring about frequent changes in ICTs used in library management	1 25.0%	3 75.0%	0 0%	9 64.3%	5 35.7%	0 0.0%	10 40.0%	8 32.0%	7 28.0%
Library education programs should be increased to raise user acquaintances with the latest developments of library	4 100.0%	0 0.0%	0 0.0%	13 92.9%	1 7.1%	0 0.0%	19 76.0%	0 0.0%	6 24.0%
Application of IT in libraries is not librarians responsibility, computer professionals need to do this	1 25.0%	3 75.0%	0 0.0%	5 35.7%	8 57.1%	1 7.1%	3 12.0%	15 60.0%	7 28.0%

^m Non-response

Table 4 shows all respondents having experience in below or equal 5 years are were interested to learn more about ICT which is similar to the respondents having experience in between 6-15years (92.9%) and about one fourth of the of respondents having experience above 15 years are interested here. It seems to be senior LIS professionals are less likely to be interested in learning about ICT. All young LIS professionals can apply ICT in their work environment which declines with more experience. This leads us to think about something else behind this experience category. Young LIS professionals think that coping with ever changing technologies is difficult for Bangladeshi librarians but most of the more experienced respondents do not think that. Young professionals are good in information retrieving from data base on the other hand more experience individuals are comparatively less capable in doing this. Young professional believe ICT can provide more data security but more experienced professionals unexpectedly do not believe that. All of respondents having experience in below or equal 5 years, 85.7% respondents having experience in between 6-15 years, 76.0% of respondents having experience above 15 years were able to implement ICT in their work environment. 25.0% respondents having experience below or equal 5 years, 64.3% respondents having experience in between 6-15 years, 44.0% respondents having experience above 15 years think it in not difficult for Bangladeshi librarians to cope with the ever changing technologies. 75.0% respondents who are having experiences in below or equal 5 years, 71.4% respondents in between 6-15, 48.0% respondents in above 15 years can retrieve information in any combination from their database. Almost 100.0% respondents having experience in below or equal 5 years, 78.6% respondents having experience in between 6-15, 64.0% respondents in above 15 years support that ICT provides high level security for the library resources. 50.0% respondents in below or equal 5 years, 64.3% respondents in 6-15 years, 48.0% respondents experienced in above 15 years seems data storage on computer is not risky in libraries compared to print resources. 100.0% , 92.9%, 72.0% respectively below or equal 5 years, having experience in between 6-15years and experience in above 15 years support that training is essential at every level of ICT up gradation in libraries. 25.0%, 64.3%, 40.0% respondents having experience respectively below or equal 5 years, 6-15 years, experience above 15 years support the statement it is not feasible to bring about frequent changes in ICTs used in library management. Almost 100.0% respondent having experience below or equal 5 years, 92.9% respondent having experience 6-15 years and 76.0% having experience in above 15 years agree with library education programs should be

increased. Most of the library professionals regardless of level of experience believe application of IT in libraries is not librarians' responsibility, computer professionals need to do this.

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Table 5.Attitudes toward Information and Communication Technology vs Academic qualification

Statement	M phil/PhD			Masters			Others		
	Yes	No	NR ^m	Yes	No	NR ^m	Yes	No	NR ^m
You like to know more about ICT	6 100%	0 0%	0 0%	27 84.4%	2 6.3%	3 9.4%	3 60%	0 0%	2 40%
You can apply ICT in your work environment	6 100%	0 0%	0 0%	22 68.8%	7 21.9%	3 9.4%	2 40%	1 20%	2 40%
It is difficult for Bangladeshi librarians to cope with the ever changing technologies	2 33.3%	3 50%	1 16.7%	12 37.5%	16 50%	4 12.5%	1 20%	2 40%	2 40%
You can retrieve information in any combination from your database	5 83.3%	1 16.7%	0 0%	20 62.5%	7 21.9%	5 15.6%	0 0%	3 60%	2 40%
ICT provides high level security for the library resources	5 83.3%	0 0%	1 16.7%	24 75%	3 9.4%	5 15.6%	2 40%	1 20%	2 40%
Data storage on computer is highly risky in libraries compared to print resources	1 16.7%	5 83.3%	0 0%	11 34.4%	16 50%	5 15.6%	1 20%	2 40%	2 40%
Training is essential at every level of ICT up gradation in libraries	6 100%	0 0%	0 0%	26 81.3%	3 9.4%	3 9.4%	3 60%	0 0%	2 40%
It is not feasible to bring about frequent changes in ICTs used in library management	2 33.3%	4 66.7%	0 0%	15 46.9%	12 37.5%	5 15.6%	3 60%	0 0%	2 40%
Library education programs should be increased to raise user acquaintances with the latest developments of the library	6 100%	0 0%	0 0%	27 84.4%	1 3.1%	4 12.5%	3 60%	0 0%	2 40%
Application of IT in libraries is not librarians responsibility, computer professionals need to do this	0 0%	6 100%	0 0%	8 25%	20 62.5%	4 12.5%	1 20%	0 0%	4 80%

^mNon-response

From Table 5 we get an idea that the higher the level of LIS education is the better the knowledge is and the good the attitudes. All of respondents with M Phil/PhD, 84.4% of respondents with Masters and 60% of respondents with others were accepted to learn more about ICT. All MPhil/PhD, 68.8% Masters, 40% others can apply ICT in their work environment. Fifty percent of respondent with M Phil/PhD disagreed that it is difficult for Bangladeshi librarians to cope with the ever changing technologies which is similar for respondents with Master and 40% for the respondents with others qualification. Most of the respondent with M Phil/PhD (83.3%) and near two third respondent with Masters can retrieve information from their database but respondents with other qualification are completely incapable to do so. 83.3% respondents with M Phil/PhD, 75% of respondents with Masters, 40% of respondents with others agree with ICT provides high level security for the library resources. 83.3%, 50%, 40% of respondents with respectively M Phil/PhD, Masters and Others disagree with data storage on computer is highly risky in libraries compared to print resources. 100% with M Phil/PhD, 81.3% with Masters, 60% with others support that training is essential at every level of ICT up gradation in libraries.

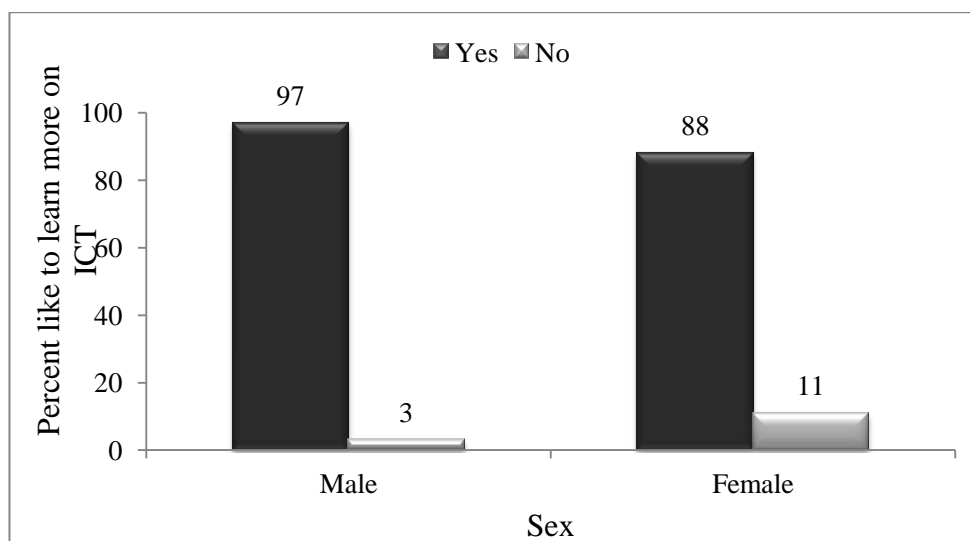
Table 6. Attitudes toward Information and Communication Technology by gender

Statement	Male			Female		
	Yes	No	NR ^m	Yes	No	NR ^m
You like to know more about ICT	29 90.6%	1 3.1%	2 6.3%	7 63.6%	1 9.1%	3 27.3%
You can apply ICT in your work environment	24 75.0%	6 18.8%	2 6.3%	6 54.6%	2 18.2%	3 27.3%
It is difficult for Bangladeshi librarians to cope with the ever changing technologies	13 40.6%	16 50%	3 9.4%	2 18.2%	5 45.5%	4 36.4%
You can retrieve information in any combination from your database	19 59.4%	10 31.3%	3 9.4%	6 54.6%	1 9.1%	4 36.4%
ICT provides high level security for the library resources	25 78.1%	2 6.3%	5 15.6%	6 54.6%	2 18.2%	3 27.3%
Data storage on computer is highly risky in libraries compared to print resources	10 31.3%	19 59.4%	3 9.4%	3 27.3%	4 36.4%	4 36.4%
Training is essential at every level of ICT up gradation in libraries	28 87.5%	2 6.3%	2 6.3%	7 63.6%	1 9.1%	3 27.3%
It is not feasible to bring about frequent changes in ICTs used in library management	16 50%	13 40.6%	3 9.4%	4 36.4%	3 27.3%	4 36.4%
Library education programmes should be increased to raise user acquaintances with the latest developments of the library	29 90.6%	1 3.1%	2 6.3%	7 63.6%	0 0%	4 36.4%
Application of IT in libraries is not librarians responsibility, computer professionals need to do this	8 25%	20 62.5%	4 12.5%	1 9.1%	6 54.6%	4 36.4%

^m Non-response

Evidence on better capacity and better attitudes regarding library digitalization among male LIS professionals than that of female professionals are found from Table 6. More than ninety percent of male respondents are interested to learn more about ICT which is much lower among female respondents (63.6%). Male respondents can apply ICT in their work environment (75.0%) and it is 63.6% for female. Around half of the respondents regardless of sex (male or female) support that it is not difficult for Bangladeshi librarians to cope with the ever changing technologies. Near sixty percent male (59.4%), and around 55% female respondent can retrieve information in any combination from their database. About seventy percent male and 54.6% female respondent agree with ICT provides high level security for the library resources. 59.4% male respondent and 36.4% female respondent believe that data storage on computer is not risky. Most of the male (87.5%) and 63.6% female respondents replied that training is essential for library management. More than ninety percent (90.6%) male respondent and 63.6% female respondent think library education programs should be increased.

Figure 1. Interest of library professionals in learning more about ICT by sex



Note: Percentages are calculated ignoring non-responses/missing values

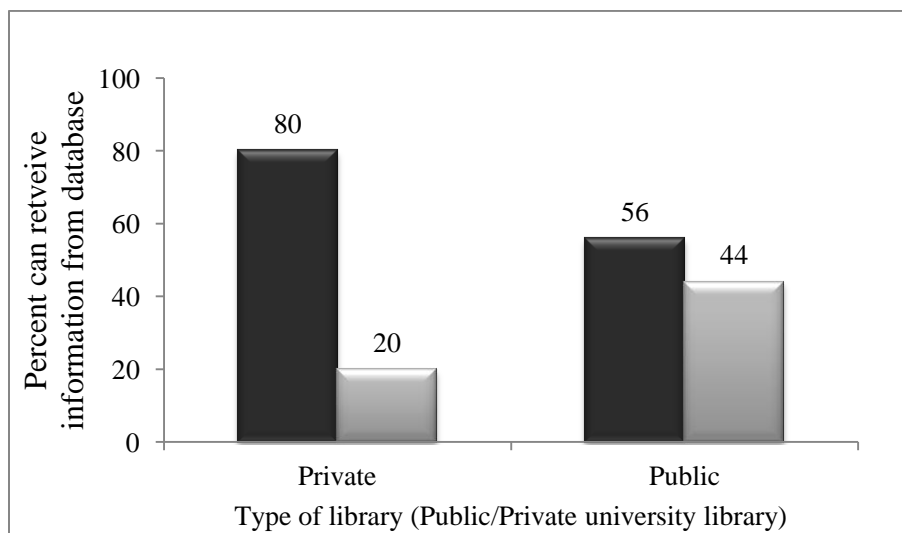
Figure1.shows that although most of the library professionals are interested to learn more about ICT regardless of sex (male or female), the male LIS professionals are comparatively more interested (97%) than the female LIS professionals (88%).

Table7. Attitudes toward Information and Communication Technology vs type of library

Statement	Public			Private		
	Yes	No	NR ^m	Yes	No	NR ^m
You like to know more about ICT	16 72.7%	1 4.6%	5 22.7%	20 95.2%	1 4.8%	0 0%
You can apply ICT in your work environment	11 50%	6 27.3%	5 22.7%	19 90.5%	2 9.5%	0 0%
It is difficult for Bangladeshi librarians to cope with the ever changing technologies	8 36.4%	7 31.8%	7 31.8%	7 33.3%	14 66.7%	0 0%
You can retrieve information in any combination from your database	9 40.9%	7 31.8%	6 27.3%	16 76.2%	4 19.1%	1 4.8%
ICT provides high level security for the library resources	14 63.6%	2 9.1%	6 27.3%	17 81%	2 9.5%	2 9.5%
Data storage on computer is highly risky in libraries compared to print resources	4 18.2%	11 50%	7 31.8%	9 42.9%	12 57.1%	0 0%
Training is essential at every level of ICT up gradation in libraries	15 68.2%	2 9.1%	5 22.7%	20 95.2%	1 4.8%	0 0%
It is not feasible to bring about frequent changes in ICTs used in library management	8 36.4%	7 31.8%	7 31.8%	12 57.1%	9 42.9%	0 0%
Library education programs should be increased to raise user acquaintances with the latest developments of the library	16 72.7%	0 0%	6 27.3%	20 95.2%	1 4.8%	0 0%
Application of IT in libraries is not librarians responsibility, computer professionals need to do this	2 9.1%	12 54.6%	8 36.4%	7 33.3%	14 66.7%	0 0%

It is found from table 7 knowledge, attitudes and practice of ICT and library digitalization are better among the LIS professionals of private university libraries than public university libraries. We see that 72.7% respondent of public university library like to know more about ICT which is 95.2% among private university library professionals. 50% respondent of public university library and 90.5% respondent of private university library can apply ICT in their work environment. 31.8% of public university librarians whereas 66.7% respondent of private university librarians disagree with that it is difficult for Bangladeshi librarians to cope with ever changing technologies. 40.9% public and 76.2% private university respondent are able to retrieve information in any combination from database. 63.6% public university respondents, 81% private university respondents are agree with ICT provides high level security for the library resources . 50% public, 57.1% private university librarians think data storage on computer is not highly risky in libraries compared to print resources. 68.2%, 95.2% respectively public and private university respondent support training is essential at every level of ICT up gradation in libraries. 72.7% public, 95.2% private university library respondent agree with library education programs should be increased. 54.6%, 66.7% of public and private university librarians believe that application of IT in libraries is librarian's responsibility, not only for computer professionals.

Figure 2. Ability of library professionals in information retrieving by type of library



Note: Percentages are calculated ignoring non-responses/missing values

Figure2. It is found that private university library professionals are more expert in information retrieving than public university library professionals. 80% of respondent of private university librarians have the ability in information retrieving, and 20% library professionals are not able to retrieve information in any combination in their database. On the other hand 56% respondent of public university librarians are able to retrieve information, 44% do not have information retrieving ability. There is a significant distinction between public and private university LIS professional regarding ability of information retrieving.

Table8. Librarians' Level of ICT education

Computer courses	Librarians	Deputy librarians	Assistant librarians
Certificate	2	6	8
	28.6%	33.3%	44.4%
Diploma	3	4	4
	42.9%	22.2%	22.2%
Masters	0	3	1
	0%	16.7%	5.6%
Others	2	3	2
	16.7%	11.1%	16.3%
Non-response	0	2	3
	0%	11.1%	16.7%
Total	7	18	18
	100%	100%	100%

From the table 8 we find that percentage of ICT education of respondents who were participated is very poor. LIS professional should raise their formal ICT education. 44.4% of assistant librarian has certificate courses, 42.9% of librarians' have completed diploma courses. Beside these other percentage was very poor. A large number of respondents remained non-response or they did not have any formal education.

Table 9. Expertise on ICT by library professional (multiple response)

Areas	Librarians	Deputy librarians	Assistant librarians
Query language	3	1	2
	42.9%	5.6%	11.1%
Library software packages	6	7	11
	85.7%	38.9%	61.1%
Operating system	3	4	7
	42.9%	57.1%	100%
Ms office	4	11	14
	57.1%	61.1%	77.8%
Design and Implementation of ICT	5	0	4
	71.4%	0%	22.2%

The respondents were asked to indicate the option in which they are expert. We find that 85.7% librarian s is expert in library software packages. Almost 100% assistant librarian is expert in operating system. 77.8% assistant librarian is expert in Ms Office, 71.4% librarian is expert in design and implementation on ICT. From table9 it is found that deputy librarian needs to improve the qualification in the area of Query language, Library software packages and Design

and Implementation of ICT. Librarians should emphasize on operating system. In the area of Query language, Design and Implementation of ICT the Percentage of assistant librarian is very low, they should emphasize on these area.

Table10. The statements that help ICT literate when do not have formal degree.

Statement	Librarian	Deputy librarian	Assistant librarian	Rank
ICT courses in your academic curricula	1 14.3%	4 28.6%	6 40%	3
Different training programs	3 42.9%	9 64.3%	9 60%	2
Conferences/seminars	0 0%	5 35.7%	6 40%	5
Your colleague or friends' co-operation	2 28.6%	3 21.4%	5 33.3%	4
Self continuous practice	5 71.4%	6 42.9%	7 46.7%	1

Respondents were asked which of the following helped you most to become ICT literate when you do not have a formal degree on it. From the table 13 it is found that 71.4% librarian, rank 1 supported self continuous practice that may help to become ICT literate, 42.9% deputy librarian, 46.7% assistant librarian were agreed with it. Rank 2 represents different training programs that can help to become ICT literate. In this table it is seen that deputy librarian and assistant librarian put more emphasize on ICT courses in academic curricula compared to librarian. Finally rank 4

and rank 5 shows colleague or friends' co-operation, Conferences/seminars which may be helpful to become ICT literate.

Table 11. Ever participation of library professionals in national and international conference by current position

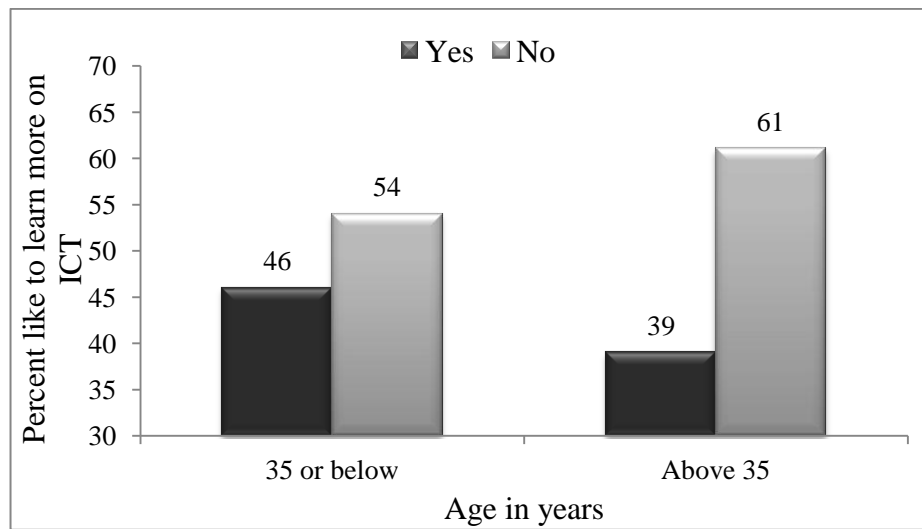
Designation	Never participated any conference	National	International	National/International
Librarian	0 0%	6 85.7%	5 71.4%	7 100%
Deputy librarian	5 27.8%	12 66.7%	5 27.8%	12 66.7%
Assistant librarian	5 27.8%	11 61.1%	10 55.6%	12 66.7%

Table 11 shows that all of the librarians participated either national or international conferences, 85.7% of librarian have participated only national conferences and 71.4% have participated only international conferences. 27.8% of deputy librarian and assistant librarian never participated in any conference either national or international and two third of them participated either in national or in international conferences. Assistant librarians participated in more international conferences (55.6%) compared to deputy librarian (27.8%).

Table 12. Involvement by LIS professionals in the organization of ICT training programs

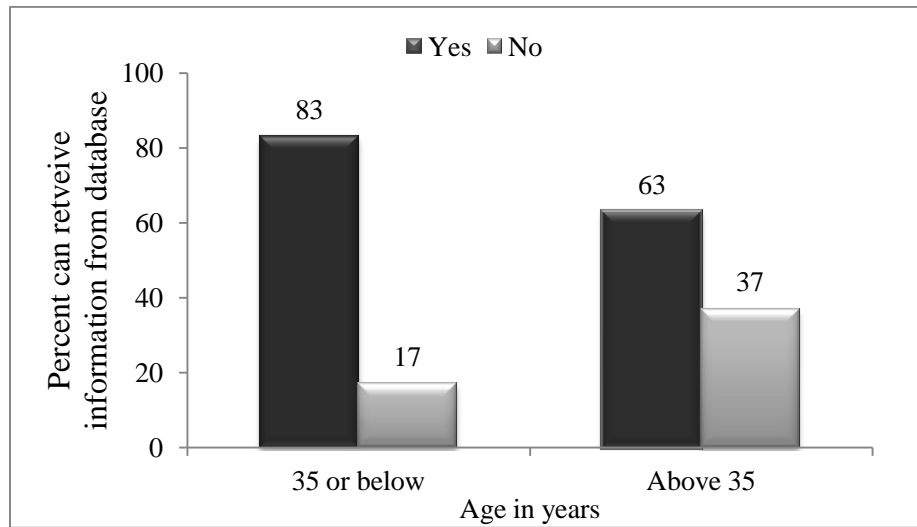
Designation	Yes	No	NR
Librarian	6 85.7%	1 14.3%	0 0%
Deputy librarian	7 38.9%	6 33.3%	5 27.8%
Assistant librarian	12 66.7%	5 27.8%	1 5.6%
Total	25 58.1%	12 27.9%	6 14%

Respondents were asked to indicate did he/she involve in the organization of any of the training programs arranged by their library or other national or international associations. It is found from Table 12 that 85.7% of librarian is involved in ICT training programs in their organizations and contribute to arrange different training programs. This involvement is much lower among deputy librarian (38.9%) and assistant librarian (66.7%). Like many other indicators non-response is much higher for this question among deputy librarian is high (14%).

Figure 3. Interest of library professionals in learning more about ICT by age

Note: Percentages are calculated ignoring non-responses/missing value. N=13 for “35 or below” age group and N=25 for “Above 35” age group

Among the young library professionals (age ≤ 35 years) 46% are interested to learn more on ICT which is 39% among older library professionals (age > 35 year).

Figure 4: Ability of library professionals in retrieving information from database by age

Note: Percentages are calculated ignoring non-responses/missing values. N=12 for “35 or below” age group and N=24 for “Above 35” age group

Librarians were asked to indicate whether they are able to retrieve information from database or not and the result is that among the librarians who are in the age group of 35 or below 83% shows positive response or yes and 17% indicates negative attitude where as among librarians in the age group of 35 and above 63% shows positive response and 37% were negative. Therefore it is clear from the result that young professionals are more likely to cope with new technologies than their senior counterparts.

Chapter Four

Findings

In the previous chapter, a detailed discussion on the analysis of data concerning attitudes of librarians towards library digitization is mentioned with the resulting references. In this chapter the major findings are discussed so as to substantiate the objectives listed in chapter 1.

The results reveal generally that librarians in the study have a positive attitude toward the use and implementation of ICT in their libraries. The reasons may include an understanding of the benefits of ICT. All of them can not apply ICT in their work environment, most of them mentioned it is not difficult for Bangladeshi librarians to cope with new technologies but in this case training is essential at every level of ICT up gradation in libraries. Analysis of variance was computed among several variables of socioeconomic variables namely age, sex, designation, professional qualifications, academic qualifications, working experience in the library and the category of library. It is observed that most of the socio-economic variables show significance change with attitude towards information technology. In the case of designation significance can be observed. This shows that there are variations among librarian, deputy librarian, and assistant librarian. 100% of librarians like to know about ICT, they can apply ICT in their work environment, training should be ensured and librarians should have IT knowledge. Working experience, LIS education, age may be the factors that affecting behind their positive attitude. From table 4 it is seen that respondents who are working less or equal 5 years are very much positive toward modern technology compared to 6-15 or above 15. We can say that sometimes working experience does not affect positive or negative attitude, it depends how much willingness they have. Table6 shows that there are variations between male and female library professionals in relation to use of ICT. Male are more interested toward ICT and shows positive attitude than female professional. From table 7 we find that private university libraries are more advance regarding library digitization than public university libraries. Young professionals more like to know about ICT than older professionals.

Recommendation

Undoubtedly, ICTs are potentially a useful tool. Application of ICT in university libraries or should be encouraged. New Information Technology demands high level of technical skills from library professionals of Bangladesh in order to make maximum use of new technological tools for providing effective and better services to the user. LIS professionals need to be positively equipped with greater skills and capabilities to survive in this new digital environment. Some of the recommendations are given that can be followed in both public and private university libraries in Bangladesh for library digitization.

- ❖ *Emphasize on IT proficiency.* In a developing country like Bangladesh, library and information science (LIS) professionals are facing severe shortage of ICT facilities. There are certain specific problems that act as deterrents to the library education of Bangladesh to adopting modernization i.e., low computer literacy among LIS professionals; lack of basic knowledge of hardware and software among working professionals; and inadequate funds for purchase of hardware, software etc . Emphasis should be given on IT proficiency.
- ❖ LIS academic curricula must be updated in developing countries particular in Bangladesh to incorporate all new technical skills which are required by the librarians. It should be revised according to the new trends in the profession. LIS curriculum must be re-structured keeping in view the new technological trends in the profession and demand of job market in digital era. It will be wise to introduce ICT courses in different academic curricula.
- ❖ *Training facilities:* Training brings about knowledge in the use of ICT which ultimately lead to a positive attitude toward the tools. In this era, when new technologies are introduced almost daily, it is essential for library staff to keep up with ICT developments. The fear of some library personnel in the developing world toward ICT is widening the digital divide. Training is the first step, which will reduce fear when implementation of ICT begins. From the survey it is found that 81.4% respondents indicated training is essential at every level of ICT up gradation in libraries. Training should be continued.
- ❖ *Financial support:* The major challenge in library digitization is the lack of finance. It is not possible to make any resource available without appropriate financial support. Poor

ICT infrastructures and lack of funding are the main hindrances to develop our library services.

- ❖ *Funds for Training*: Library should provide enough funds to provide necessary training for the staff. A minimum of total budget of university should be allocated to the university library.
- ❖ *Knowledge Sharing*: The various libraries can develop some kind of cooperation to share the resources available. Some kind of organizational strategies can be developed in this regard especially for Bangladesh. Training and experience with particular events, behavior, or action affects the attitude of an individual toward them. Adequate training and knowledge of ICT are crucial in encouraging librarians to show a positive attitude toward it.
- ❖ *Adequate manpower and skilled personnel*: Manpower is one of the prerequisite of the successful implementation of digitization and digital information system. Unfortunately working knowledge regarding ICT based library systems among the practicing librarians and supporting staff is still below the expected level. The information professionals and their higher authority should recognize this need and take necessary action.
- ❖ *Arranging seminar /conferences*: It is recommended that Library Associations working in the country should organize useful training courses, seminars and conferences which may help in librarians' attitude towards library digitization in the country. Participation in national and international conference/ seminars ,meetings of LIS professionals *Can be* important factors behind positive attitude of librarians' towards library digitization.
- ❖ *Guidance of well-trained and positive librarian*: librarians should be courageous to seek ICT skills, need to introduce and work with information communication technologies. The librarians should understand the weakness and strength of their organizations. Further, there is need for developing infrastructure in libraries.
- ❖ *Job satisfaction*: Job satisfaction is an important factor, which influences the library personnel as well as the services, to enhance the level of job satisfaction salary, working environment should be developed.
- ❖ The survey result shows female are less interested than male professional. Why female are less interested in Information and communication technology can be identified. Although female LIS professionals in developing countries like Bangladesh have little

contact with the new technologies but favorable working environment can make them interested to adjust with the new technological changes. Continuous training is needed for female library professionals.

- ❖ Although the govt. of Bangladesh has taken initiatives for library digitization, still it is in the primary level. Study shows public university libraries are behind regarding library digitization than private university libraries. The government of Bangladesh should allocate adequate fund for purchasing and maintenance of ICT and other related technologies. Also there is a necessary to revitalize the negative interest of the authorities in all respect of the application of Information and Communication Technologies.
- ❖ Self-continuous practice: There is no alternative of self-continuous practice to become ICT literate. Most of the respondents in this survey were agreed with it. This can also help a person to learn successfully.

Conclusion

The tremendous growth of information and communication technology has made library services a challenging profession. So, switching from traditional librarianship to its digital format librarians are confronting various tough situations in our country. Thus, even today both public and private university libraries are unable to establish a full-fledged division of information technology. The public university library digitalization system in the country still presents a poor picture and is rather passing through a traditional stage. It is expected that young group of professionals will be able to organize the entire public university library systems of Bangladesh. The success of a digital library is fully dependent on skilled and dedicated librarian who will ensure that the digital libraries are used effectively. Necessary professional education and training on ICT, technological knowledge and skills required for a librarian should be ensured for young library professionals of Bangladesh in order to keep pace themselves with modern technology.

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Appendix

Survey Questionnaire

Librarians' attitude towards library digitization: a comparative study among selected public and private university libraries in Bangladesh.

Part 1: Demographic variables and status of the libraries

1. a) Name:

b) Designation:

- Librarian
- Deputy librarian
- Assistant Librarian

c) How long have you been in your current position?

- | | |
|---|-------------------------------------|
| <input type="radio"/> Less than 5 years | <input type="radio"/> 6-10 |
| <input type="radio"/> 11-15 | <input type="radio"/> 16-20 |
| <input type="radio"/> 21-25 | <input type="radio"/> over 25 years |

d) Your experience as library professional is in the range of:

- | | |
|---|-------------------------------------|
| <input type="radio"/> Less than 5 years | <input type="radio"/> 6-10 years |
| <input type="radio"/> 11-15 years | <input type="radio"/> 16-20 years |
| <input type="radio"/> 21-25 years | <input type="radio"/> over 25 years |

e) Your highest LIS education level is:

- | | |
|---------------------------------------|-------------------------------------|
| <input type="radio"/> Certificate | <input type="radio"/> Diploma |
| <input type="radio"/> Bachelor degree | <input type="radio"/> Master degree |
| <input type="radio"/> M Phil | <input type="radio"/> Ph D |
| <input type="radio"/> Others..... | |

f) When did you receive your latest professional qualification? []

g) You are: Male Female

h) You are in the age group of:

- | | |
|--------------------------------------|--------------------------------------|
| <input type="radio"/> Below 25 years | <input type="radio"/> 26-30 years |
| <input type="radio"/> 31-35 years | <input type="radio"/> 36-40 years |
| <input type="radio"/> 41-45 years | <input type="radio"/> Above 45 years |

i) Category of your library:

- Public University Library

 Private University Library

j) Are you using any library management system/software)?

- k) If yes, please mention the type of the software:

 Yes

 No

- Package software
- Open source software
- Customized software

l) Does your library have OPAC (Online Catalogue)?

 Yes

 No

m) Does your library have its own website?

- No

 Yes (URL Pls.).....

n) Does your library have a Web OPAC?

- No

 Yes (URL Pls.)

o) Are you using barcode for check out/in of materials?

 Yes

 No

Part 2: Qualification and training of library professionals on ICT

2. a) You have been using computer for

- Less than one year
- 1-3 years
- 4-6 years
- 7-9 years
- Over 9 years

b) You are expert in (You may select more than one)

- Query language
- Library software packages
- operating systems
- MS Office
- design and implementation of ICT

c) Your level of ICT education

- Certificate Course

 Diploma

 Masters

 Others.....

d) If you do not have any formal education on ICT yet then do you have any plan to obtain a formal degree in future.

- Yes No

e) Which of the following helped you most to become ICT literate when you do not have a formal degree on it: (You may select more than one)

- ICT courses in your academic curricula
- Different training programs
- Conferences/seminars
- Your colleague or friends' cooperation
- Self continuous practice

f) Do you constantly keep abreast of new technological developments?

- Yes No

g) If yes, then what is/are the method/s?

- Training courses
- Seminars and conferences
- Continuous self practice

h) If training courses are the only means that helped you to gather knowledge on ICT then please mention the number of training courses you participated till date. []

i) How many of the training courses, attended by you, were organized by your library?
[]

j) Did you finance for any of your training courses? If yes, please mention the number.
[]

k) You attend the last training program in the time span of:

- Less than one year
- 1-3 years
- 4-6 years
- 7-9 years
- Over 9 years

l) Did you attend any national and/or international conference to update your knowledge on ICT application in libraries? If yes, please mention the number:

- National [] International []

m) Did you involve in the organization of any of the training programs arranged by your library or other national or international associations?

- Yes No

n)If no, what was the reason:

- You are not reluctant in such kind of activities
- You did not get invitation

Part 3: Attitudes toward Information and Communication Technology

(Please describe your personal beliefs and attitudes toward ICT application in libraries)

YES [1]

NO [2]

(Please read each statement and circle the number that best describes your opinion.)

3.a	You like to know more about ICT	1	2
3.b	You can apply ICT in your work environment	1	2
3.c	It is difficult for Bangladeshi librarians to cope with the ever changing technologies	1	2
3.d	You can retrieve information in any combination from your database	1	2
3.e	ICT provides high level security for the library resources	1	2
3.f	Data storage on computer is highly risky in libraries compared to print resources	1	2
3.g	Training is essential at every level of ICT up gradation in libraries	1	2
3.h	It is not feasible to bring about frequent changes in ICTs used in library management	1	2
3.i	Library education programmes should be increased to raise user acquaintances with the latest developments of the library	1	2
3.j	Application of IT in libraries is not librarians responsibility, computer professionals need to do this	1	2

[Thank you for your nice cooperation]